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THE TEMPLE PRIMERS

THE CHILD
HIS NATURE AND NURTURE

By

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THE AGE OF INNOCENCE

From a Picture by Sir Joshua Reynolds

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BY W. B DRUMMOND

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PREFACE

This little book is intended as an introduction to the study of the physical and mental development of the child. The work is elementary in scope and practical in aim, and the bearing of the results of child-study on the education and care of children is kept in view throughout.

The limitations of space have necessitated considerable compression, but the author trusts that conciseness of diction has not resulted in obscurity of meaning. A number of subjects have been omitted entirely, in order that others, perhaps not intrinsically more important, which are included, might be made more fully illustrative of general principles.

The short list of references at the end includes a number of works likely to be useful to those who wish further information on the subjects treated of. Fuller bibliographies are readily accessible.

W. B. D.

9 Brougham Place, Edinburgh,
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THE CHILD: HIS NATURE AND NURTURE

CHAPTER I

Nature and Nurture

The extreme helplessness of the human infant is perhaps its most striking characteristic. It is not its most remarkable characteristic. Compared to the young bird which can look after itself shortly after escaping from the egg, or the young lamb which can run beside its mother when a few hours old, the human infant is indeed helpless. Yet helplessness does not necessarily mean anything more than immaturity, and many animals are even more immature at birth than is the baby. The young kangaroo, for example, at the time of its birth measures little over one inch in length, and for some time afterwards its helplessness is so great that it cannot even suck, and the milk has to be forced down its throat, as it hangs on the nipple, by the action of a muscle which compresses the mammary gland.

The helplessness of the infant is not merely the result of immaturity like the helplessness of the baby kangaroo, but is the concomitant of another character which, if less striking, is far more remarkable. This character may be designated "educability." It is not absolutely peculiar to the infant, being found also in the young of many other animals, but it may almost be said that while it is given to the brutes in measure, it is given to man without measure.

The Biological Importance of Educability.— Let me give examples to illustrate this feature. Mr Spalding blindfolded some chickens immediately after they were hatched, and after two or three days, when they were stronger, removed the hoods which he had placed over their eyes. He says that their behaviour "was in every case conclusive against the theory that the perceptions of distance and direction by the eye are the result of experience, or of associations formed in the history of each individual life." "Often at the end of two minutes they followed with their eyes the movements of crawling insects, turning their heads with all the precision of an old fowl. In from two to fifteen minutes they pecked at some speck or insect, shewing not merely an instinctive perception of distance, but an original ability to judge, to measure distance, with something like infallible accuracy." Contrast this with the behaviour of a baby several months old. Miss Shinn reports of her niece that she grasped at the moon, and when told it was too far away was not satisfied until she had seen everyone in the room in turn stretch out their hands to demonstrate that they also could not reach it. These two examples illustrate very clearly the contrast between educability and instinct. The chick comes into the world endowed with an inherited capacity for doing certain things which the child also will have to do. But the child is born, not with the power of doing, but with the power of learning. In time it will localise its perceptions in space as accurately as the chick, but not until it has learned by experience after many mistakes and many failures.

At first sight it might seem that the chick had here an advantage over the child. Why is it that the child should have to learn with so much trouble, and often with pain, what the lower animals can do by nature? Might these things and others yet more hard to learn not equally well have come to him by instinct? These instinctive actions of the chick which have been quoted are of course comparatively simple, but when we consider such instincts as

the comb building of bees, the tunnel making of termites, the slave-making of *Formica rufescens* and other ants, there seem to be hardly any limits to the variety and complexity of the actions which may result from appropriate stimuli acting upon inherited nervous mechanisms. It is often very difficult to tell whether a certain habit in an animal is to be called instinctive or intelligent, and actions which are certainly purely instinctive have sometimes a very odd resemblance to intelligence. Take this example, given by George and Elizabeth Peckham in their monograph on the Solitary Wasps. These insects make nests which they furnish with prey to serve as food supply for the young. Each species has its own particular habits in the way it makes its nest and in its choice of prey. *Sphex ichneumonea* makes a hole in the ground. She then captures a grasshopper, places it just at the entrance to the excavation, and then enters to see that all is right before dragging it in. In experimenting with a French *Sphex* which has the same habit, "Fabre moved the creature a little way off; the wasp came out, brought it to the opening as before, and went within a second time. This was repeated again and again until the patience of the naturalist was exhausted, and the persistent wasp took her booty in after her appropriate fashion. She must place the grasshopper just so close to the doorway, she must then descend and examine the nest, and after that must come out and drag it down. Nothing less than the performance of these acts in a certain order satisfies her impulse."

This interesting observation illustrates not only the perfection of an instinctive action, but how an instinct may fail through its very perfection. We do not know whether to be more surprised at the normal behaviour of the wasp, or at its inability to cope with a trifling emergency, where the slightest gleam of intelligence would surely have guided it aright. It is just here that we find the superiority of the simplest intelligent actions over the same or similar actions performed instinctively, and why it is that in recent times a premium has been placed on educability over instinct. In the

struggle for existence among the higher animals brains have come to count for more and more. The history of the higher animals of our own day has been in the main a history of evolving brain power. During the untold ages which preceded the appearance of the mammalian type Nature gave almost her whole power to the evolution of perfect bodily form. When in the early tertiary period intelligence began to count for something in the struggle for existence, the brain of the highest animals was, according to modern standards, absurdly small; but in the period which has elapsed since then, the brain has undergone, amongst the mammalia, a far greater development in size and complexity of structure than it did in all the preceding ages.

The development of intelligence, then, we may look upon as having been closely associated with the replacing of instinctive acts by habits which were acquired anew by the individuals of each generation, who were thereby enabled to adapt themselves to alterations in their environment, to deal with emergencies, and to obtain supremacy over individuals and species more closely bound in the mesh of circumstance. But this lapsing of instinctive powers, at any rate of those necessary for the individual life, could not proceed very far until provision was made for the care of the young during the period of acquirement or education. Hence it is that we find the greatest intelligence among those animals that take care of their young, and we may agree with Mr Fiske in finding in the prolongation of the period of infancy in man the preliminary requisite for the evolution of his highest faculties.

From these considerations then it appears that the infant with "its all-pervading similitude of structure" to that of the higher mammals differs from them very markedly in this, that it inherits from its parents a far smaller stock of ready-made instincts,[1] and still more in this, that it inherits an infinitely larger capacity for education. And by capacity for education is meant nothing less than this, that the child from his earliest infancy tends to adapt himself to his environment, to yield

[1] See chapter xi., "Instinct and Habit."

himself, like clay in the hands of the potter, to be moulded day by day by the habits, the tastes, the passions, the ideals of those among whom he lives, to be impressed in a thousand ways for good or for evil by all he sees and hears. "Wax to receive and marble to retain," he is influenced for life by the early impressions which touch his body and his mind. "There was a child went forth every day; and the first object he looked upon, that object he became; and that object became part of him for the day, or a certain part of the day, or for stretching cycles of years." (Whitman.)

These biological considerations are of considerable importance at the present time, for there is a tendency, I will not say to lay too much stress upon the influence of heredity, but to take a somewhat narrow view of what heredity really means. Heredity is spoken of as our ancestors spoke of Fate. Nature is stronger than Nurture, it is said, and this is regarded as equivalent to saying not only that the child inherits certain tendencies from his parents, but that these must of necessity develop when the time comes. Many realising in themselves an inherited tendency to yield to a particular temptation, or to contract a particular disease, are discouraged from striving to escape from what they regard as a decree of Fate. There is no use fighting against Nature, they say. But if we realise that nature in the case of the child is in large measure a capacity for reacting to his environment, and that his environment is in large measure under human control, then no matter what views we may hold upon such disputed questions as the inheritance of acquired characters, we reach this conclusion, that, however certain it may be that whatsoever tendencies, either good or evil, the child inherits from his parents will shew themselves if the environmental conditions are favourable, it is just as certain that they will *never* shew themselves if the conditions are unfavourable. In the facts that it is possible for man so to alter the environment of the infant as to favour the preservation of good qualities, and to hinder or prevent the development of evil tendencies, and that the infant has a marvellous capacity

for individual adaptation to such changes, we find the greatest encouragement to efforts at social reform.

Nature and Nurture.—Let us speak of all the physical, mental, and moral agencies which surround the growing child, all the domestic, scholastic, and social influences brought to bear upon him, under Mr Galton's convenient term Nurture. Nature and nurture each have their own part to play in the development of the child. To nature he owes his possibilities; to nurture he owes his realisations of these. He can only realise his highest possibilities if his nurture be adapted to draw them forth.

This power of individual adaptation to altered nurture is possessed in only a very slight degree by the lower animals—a good example, however, is found in the bee-grub which becomes a queen or a worker according to its diet—as indeed necessarily follows from the comparative simplicity of the conditions of their existence, even in those cases where a comparatively long babyhood might render such adaptation possible. It is very different from the slow process of adaptation which is brought about by the operation of natural selection, which of course also affects human life. As an example of the human power of individual or direct adaptation let us consider what happens when a child accidentally loses his sight in earliest infancy. Although the change here supposed is in the child, it really alters the whole outside world *to* him, and necessitates the most profound adaptive changes *in* him. We may consider this a change in his physical environment. To us it seems that the child is blind; to him it appears that the world is in darkness. Now the adaptive changes which result in the child, summarised in the briefest manner possible, are these. In the first place the visual centres of his brain never undergo development at all. This necessitates his acquiring all his knowledge of the world through his other senses, which he cultivates until they acquire an amazing acuteness. The parts of the brain which act as centres for these senses not only undergo a higher degree of cultivation than they normally would, but they

form among themselves a quite new series of association tracts. In addition to all this, many blind persons acquire what may almost be called a new sense, sometimes called the face sense, by which they are able to tell the position and to some extent the size of solid bodies placed near them, so that they can walk about freely and avoid obstacles even in a strange place.

If such a remarkable and far-reaching series of organic changes can be brought about by a change in the physical environment, what may not result from a change in the social, or the mental, or the moral world in which the child grows up? Every child, no matter what his parentage, comes into the world with numerous possibilities; with numerous tendencies both good and evil. What these are depends upon his nature; which of them are to develop, and what form they are to take depends upon his nurture. Let him come into the world with strong social instincts, these may atrophy if he is brought up in solitude, or may make of him, according to his nurture, a society man, or a philanthropist, or an anarchist.

The importance of education both for the purpose of imparting instruction and for moulding character is of course well recognised. What is not sufficiently realised is the importance of these early months and years which nature has set apart in order that each generation may start afresh. The past acquirements of the race are not simply transmitted to the infant. They have in large measure to be re-acquired by each individual. There should be far more earnestness in our endeavour to understand the child, the hope of the family and of the nation, and to surround him with every helpful and wholesome influence. "During earliest childhood," said Plato, "the soul of the nursling should be made cheerful and kind, by keeping away from him sorrow and fear and pain, by soothing him with the sound of the pipe and with rhythmical movement."

Heredity.—Yet though I speak strongly of the influence of nurture, I would not be thought to undervalue the import-

ance of a good stock. Children are not autochthones. Their roots stretch far back into the past. They owe to their ancestry all the promise of what they may be. The child does tend to be like his parents, or his grandparents. Mr Galton tells us that the child owes one-fourth to each of his parents, and to each of his grandparents one-sixteenth.

There has been much discussion of late years as to the possibility of the transmission of acquired characters, and most naturalists are agreed that such transmission is at least unproved. A great deal of the literature on the subject is based upon an imperfect understanding of what is really signified by the term acquired. Some writers seem to think it is to the point to argue that, if the doctrine of evolution is true, every new character must have been acquired some time, and must have been transmissible, otherwise evolution could not have taken place. But naturalists use the term acquired in a special restricted sense, to denominate a character arising in the individual as the result of use or disuse, or as the *direct* effect of external influences. A young man's moustache may be an acquisition, but it is not in the biological sense an acquired character; but a growth of hair due to repeated irritation of the skin, for example by the chafing of a belt, would rightly be termed acquired. Again if a man's hair falls out or turns grey at thirty without any obvious reason we do not speak of his baldness or greyness as acquired, but if it results directly from an illness we do. And in the one case we may expect his son to turn bald or grey prematurely, in the other we have no right to do so.

Another source of difficulty is that all acquired characters, with the exception of accidental or experimental mutilations, have a congenital basis. No amount of chafing will produce a growth of hair from a part of the body where there are no hair bulbs. No amount of application will make a musician or a mathematician of a man who does not possess the structural conditions necessary for such accomplishments. And therefore when we find the son of a mathematician or a musician following in his father's footsteps we find no proof in this that

acquired characters are inherited, but merely that the boy, having inherited from his father the necessary neuromuscular basis, which in the father was innate and therefore transmissible, acquired his accomplishment in the same way as his father did before him, but all the more easily on account of his father's tastes and habits, his instruments, and books, and friends, and reputation.

So also in the case of diseases, the fact that certain ailments such as consumption, and rheumatism, and gout run in families merely proves the transmission of a congenital inability to resist the attacks of such diseases when the external circumstances are such as to favour their acquisition. The direct inheritance of certain diseases is regarded as due to infection of the offspring before or at the time of birth. The whole question is very complicated, and it would be out of place to discuss it fully here. It seems to me that it is probably true that characters acquired by use or disuse are not transmitted. But I believe that it is not improbable, even if it cannot be said to have been proved, that acquired constitutional changes may in some instances be inherited, or at any rate produce secondary effects upon the offspring. I think for example that it is rash to assert that the nutritive changes produced by insanitary surroundings, the toxic effects produced by certain poisons when their influence is long continued, and the constitutional effects produced by some diseases, *cannot* bring about changes in the reproductive cells which will affect the offspring.

If we accept this doctrine of the non-inheritance of acquired characters it must emphasise for us the necessity for the most careful nurture in the child of those good qualities which his parents possessed, but it may also save us from the feeling that we are struggling against nature in trying to overcome tendencies to evil. While we dare not trust to the good qualities of the parents reappearing in the child without patient and careful training, we need not despair of eliminating defects which may have no root in the child's nature.

The Survival of the Unfit.—There is one other

subject which, on account of its importance, must be referred to briefly here. There are many people at the present day who seem afraid lest in trying to make the conditions of life more easy, and to diminish the intensity of the struggle for existence, we are merely providing a burden for the future by permitting the unfit to survive. It is seriously argued that diseases are really beneficial in their operation, by weeding out the unhealthy from among us, and allowing a more vigorous stock to survive. It has even been asserted that all the efforts of temperance reformers only perpetuate the evil of drunkenness by preventing the elimination of those who are unable to withstand the temptation to drink.

Now it is certainly the case that we owe much of our present knowledge of disease, and much of the improvement which has taken place in recent years in the sanitary arrangements of our houses and our towns, to efforts to cope with epidemic disease, and there is no more certain evidence that the drainage and water supply require looking to than an outbreak of typhoid or other water-borne disease. To this extent we may believe that disease has been beneficial in its operations. But as an eliminating factor in the struggle for existence, such epidemics strike both the just and the unjust, both the weak and the strong. The blow falls, not on individuals who are unfit, but on communities that have failed to take heed in time; and though the weak doubtless suffer most, the weakness of childhood may prove as fatal as weakness of constitution. Salvation for the community is not to be found by waiting for the slow and somewhat problematical appearance of immunity through selection, but by turning from the ways of error.

Again, with reference to diseases which attack not communities but individuals, who presumably have some inherent weakness of constitution, I believe that even here it is impossible for us by any effort towards social righteousness really to find ourselves fighting against nature. The conditions of existence in human society are extremely complex, and no matter what changes we may make in these conditions the

fittest will continue to survive in the future as in the past. If we succeed in so altering the conditions as to eliminate some special selective agency, such as the assault of a particular disease, we no doubt prevent the race from acquiring through natural selection immunity from that disease. In other words, we prevent it from attaining perfect adjustment to the old conditions. But this need not necessarily be a disadvantage unless the old conditions return. By the practical disappearance of small-pox and cholera from our midst, not by the natural acquisition, through natural selection, of immunity, but by artificial shelter from assault, have we as a nation been rendered weaker? On the contrary those who were most susceptible may not in other respects have been unfit, but may have been possessed of many desirable qualities which could ill be spared; and in any case they were still open to the action of all other selective agencies.

A second result of great importance which follows any wise measure of sanitary reform is to be found in the increased health and well-being of all those who in other circumstances would have survived attacks of disease, but in a weakened condition; for every decrease in mortality which has followed sanitary improvement has meant not only the survival of so many per thousand who would in former circumstances have died, but the entire escape from illness of many who would indeed under the old regime have survived, but in a condition of perhaps permanently lowered vitality. This statement applies with especial force to infants and young children. The infantile mortality is acknowledged to be a most reliable test of the sanitary condition of a district. From our present point of view a high infantile mortality means that the surviving children are growing up in conditions where a healthy human life is not possible. Natural selection is doubtless weeding out the unfit; it is at the same time preserving a race who will be fit, it may be, for life in a slum—and for nothing better. The enormous percentage of rejections in the medical examination during recent recruiting in our large towns is a striking commentary on the fact that

the infantile mortality in these towns averages something like 150 per thousand.

CHAPTER II

Child Study

THERE were great educators before Rousseau; yet to Rousseau, in spite of all his vagaries, exaggerations, and paradoxes, we owe many of the doctrines which in our own day are becoming the dogmas of the New Education. At one time it was considered ample qualification for a teacher that he knew the subject he proposed to teach, and the idea that knowledge can be handed on from one to another by means of words only is not so foreign to much of the teaching of our own day. Yet the fundamental importance of a knowledge of children's ways to any one who aspires to teach them is so obvious that one knows not whether to be more surprised that Rousseau should be credited with having been the first to base education entirely on a study of the child to be educated, or that in doing so he was so much before his time. It is not a little curious to compare many of the results of the modern child study movement with the educational doctrines propounded by Rousseau, whose influence may be traced in the teaching of all the great educators who succeeded him.

It is only in our own day that Child Study has become a movement organised in the form of numerous societies in all parts of the world, and indicating its energy by the issue of an enormous body of literature. The recent rapid growth of the movement is traceable chiefly to the scientific work of Darwin and to the impulse which the doctrine of evolution has given to all branches of scientific research. Doubtless a subsidiary reason for this progress is to be found in the promise the movement holds out of results of educational value and of the establishment of a true science of pedagogy.

In other words, the interest in the subject is in the first place scientific, and in the second practical.

The sciences which deal with the study of child life are physiology, anthropology, and psychology, and none has taken the child so seriously as the last.

The study of the physiology of the child has been rewarded by a fuller knowledge of the conditions necessary for healthy child life. It has placed on a scientific basis our knowledge of the special requirements of the growing child for fresh air, for food and clothing, for rest and exercise; and this knowledge is being taken advantage of in improving the sanitary conditions of houses and schools, in inspecting and regulating the milk supply, in providing playgrounds and open spaces in our large towns, and in arranging trips to the country for poor children.

The doctrine of evolution has added enormously to our interest in the beginnings of things, and it is from this side that the science of anthropology comes into touch with childhood. Every child in the course of his growth, according to the doctrine, passes through stages which correspond to stages in his ancestral history. From this point of view we interpret the child's instinctive love of animals and his understanding of them, his impulsiveness, his often ungovernable passions, and many other traits which appear and disappear; and hopes are entertained that a fuller knowledge of the course of development in the child may throw light on many important questions, for example on the origin of language.

Side by side with direct observation of the child must go interpretation. This is the province of the science of psychology. This is the most difficult branch of child study and the most fascinating. He who would undertake it must be gifted not only with the power of observing with scientific accuracy, but with what has been called the scientific imagination. He must love his subject and his subjects. He must possess an understanding heart and sympathetic insight, and be able to lay aside his own grown up habits and ways of looking at things. Only by becoming again as

a little child can he hope to sit down with the child in his kingdom, and once more to see and hear and understand *as a child.*

In these words *as a child* we find the key to the practical educational value of child study. We are learning that the child does not see *as* we see, and therefore does not quite see *what* we see, and that therefore to at least that extent words do not mean to him, even when they are used by him and not by us, exactly what they mean to us. A fuller knowledge of the child's normal mode of mental and moral growth, and the way in which he reacts to the different materials of instruction, must make great changes in our present methods of training him, and especially in the methods of school training. Instruction must give place to education. Instead of giving the child knowledge we must teach him to seek after wisdom.

The Methods of Child Study.—The methods which have been followed in the direct study of children fall naturally into two classes which we may call the Individual and the Collective Methods.

By the Individual Method is meant the careful recording of the events in the life of an individual child as they occurred, and we now possess a considerable number of more or less complete records of this class. Among writers who have contributed to this field of child study may be mentioned Tiedemann, Sigismund, Darwin, Preyer, Sully, and Pollock. M. Perez's delightful "First Three Years of Childhood" really belongs to this class, although the author has not followed the biographical method, but has recorded the evolution of the different faculties in a number of his young friends. More recently Miss Shinn has published a very full record of the development of her niece, and Mrs Winfield S. Hall has given us a very thorough study of the first five hundred days in the life of her son.

Although such records cannot be taken as typical on account of the great individual differences which may exist even between children in the same family, yet there is often

a very close correspondence in the order of events. For example take the behaviour of Baby Hall and Baby Preyer towards their reflection in a mirror: both babies first noticed their image in the seventeenth week; both first laughed at their image in the seventeenth week; both looked at an image and then turned to find the real object in the twenty-fourth week; both licked the image in the sixty-first week. Baby Preyer turned the mirror round to find the child in the fifty-seventh week, baby Hall in the forty-ninth week. Baby Preyer made grimaces at his image in the sixty-seventh week, baby Hall in the sixty-second week. The points in which children diverge most widely from what may be considered the type are themselves of the greatest interest, and are worthy of the closest scrutiny from the suggestions they may give us of the existence of faults which require rectifying, or of talents which require cultivating. For example a child may be unduly late in learning to talk, and this naturally suggests the fear that he is feeble-minded. Yet an examination may show that he is slightly deaf; or that he is suffering from the want of the stimulus of young companions; or again that he is one of those children spoken of by M. Perez who will not make use of words until they grasp their meaning, but who, although very slow in beginning to talk, make very rapid progress when they do begin.

The Collective or Mass Method of studying children consists in the examination of special points in a large number of children for the purpose of gaining knowledge of the typical course of development, and so forming a background as it were against which individual children may be studied. This method includes the physical examination of children whereby we ascertain the average weight and height at different ages, the average rate of growth, differences in the relative measurements of the various regions of the body at different ages, differences between the sexes, and so on. It includes in the next place the application of experimental tests such as the examination of the hearing power, of acuteness of vision, of colour vision, of the prompt-

ness of reaction to various stimuli under various circumstances, such as fatigue. Lastly, it includes the examination of replies made orally or in writing by large numbers of children to questions designed to bring out some definite fact in their mental history.

For the purpose of carrying out the experimental methods of investigation psychological laboratories have been established, especially in Germany and America, and furnished with apparatus for the purpose of making exact observations. The appliances used include colour mixers, lenses, prisms, and other instruments for testing the senses of sight, hearing, taste, temperature, etc.; more complicated apparatus for measuring the time required for mental processes; and instruments for the experimental investigation of such mental processes as memory, attention, and so on.

Apart from these direct methods of studying the child there are several indirect methods by which we may obtain assistance, but which cannot take the place of the direct methods.

The spontaneous writings of children in the form of letters, essays (not class exercises), and autobiographies, often furnish excellent examples of the childish ways of looking at things, especially when the child has made a confidant of a diary not intended to be seen by others. The journal of Marie Bashkirtseff which attracted so much attention a few years ago is a good example of this kind. We are promised a further series of writings from her pen.

Many autobiographies contain interesting reminiscences of childhood, but these are frequently written merely to illustrate the features bearing on the later career of the writer, and are coloured by his later personality and prejudices.

Then we have the portrayal of the child in fiction and in poetry. But the child depicted by the author or the poet is often not the child we know, but the child of genius, the artist or poet in miniature. Wordsworth represents to us the subjective aspects of the mind of a child-poet. Stevenson,

in his "Child's Garden of Verse," portrays the child of genius, a genius which extends to all about him, as to the cow "who gives me cream with all her might to eat with apple tart."

It is noteworthy, however, that Wordsworth testifies to his own childish experience as the voicing of vague feeling more or less universal in the normal child. He has taught us that the child is not simply an immature man; that something may even pass out of life when childhood's days are gone, and "the things which we have seen we now can see no more." Are we to set aside the testimony of a poet to a universal experience as mere sentimentalism, the projection of his own emotionalism upon the object of his imagination? Or may not the selective emotion of a poet sometimes discover traits which are hidden from the cold-blooded scrutiny of science? No doubt one must distinguish between science and poetry, and in all scientific work the most watchful restraint is necessary lest sentiment should cloud the judgment. But will a man who has a keen eye for the poetic aspect of child life, and who is sensible of the peculiar charm of infancy, be rendered unfit thereby to trace the first beginnings of those traits which are afterwards to form the fibre of the child's conscious life? May he not be all the better qualified to seize the germ of what afterwards blossoms into consciousness?

Perhaps, however, there may be some mean between Wordsworth's apostrophe to the child,

> "Mighty prophet! Seer blest,
> On whom those truths do rest
> Which we are toiling all our lives to find;"

and the cruel query of a man of science, who asks, "Is there in sober truth any other living creature's offspring which is so passionate, so selfish, so noisy, so troublesome, so exacting, so offensive in some respects as the human baby?" Says Rousseau in "Emile," "Un instant vous diriez: C'est un genie, et l'instant d'après: C'est un sot. Vous vous tromperiez toujours: *C'est un enfant.*"[1]

[1] Quoted from Tracy ("The Psychology of Childhood").

The Practical Results of Child Study.—In the following pages we shall frequently make use of the results, both theoretical and practical, which have been reached by the various methods which have just been briefly sketched. Some of the educational results which have been arrived at are not, strictly speaking, new, but it is not the smallest of the claims of the Child Study movement that it has succeeded in bringing home to large numbers of teachers thoughts and methods which had for long been the theories, and even the fads of a few.

The systematic observations which have been published on the development of individual babies have aroused the interest of many parents, have stimulated them to observe their own infants carefully, and have helped them to understand them in a way they could not have done without such assistance. They have also impressed upon them the fact that the child's education begins in the cradle, and that the years before the child goes to school are at least as important to both the mental and the bodily nurture as are all the years of school life.

A similar service has been rendered to innumerable teachers by bringing before them the fact that child study is a daily problem presented by every child in their class. Teachers who have undertaken special observations on their children have been rewarded by finding a fresh interest in their work, and by gaining an insight into the individuality of their pupils such as they had never before acquired. Such observations may also indicate faults in the method of teaching. For example, in an American school an inquiry was made as to which subjects of study the children liked, and which they disliked. It was found that 76 per cent. of the boys who were studying geometry expressed dislike to it. The teacher's attention was called to this and he was greatly surprised. "On reflection it occurred to him that the reason must be that he undertook to do more than the class were able to stand." Consequently, "he reversed his methods and determined that he would cover the ground only as fast as his pupils could do

it thoroughly. Three months later he polled the same class again, whereupon 75 per cent. declared that they specially liked geometry."[1]

The collective method of investigation is showing clearly that under all the individual peculiarities of children we come upon the reign of law. Not only the physical but the mental and spiritual development of every child takes place in accordance with law. All true education must be based upon obedience to these laws. Many of these laws have in past times been obeyed more or less blindly. It is the function of child study to enable teachers to understand and obey them intelligently.

Every individual child passes through certain definite stages of development, which are indeed not sharply separated from one another, but which may be represented somewhat as follows:—

(*a*) A stage of sensation, in which the various sense organs are acted on by the outside world, and responsive movements are noticed more or less definitely indicative of pleasure or pain.

(*b*) A stage of perception with differentiation of the sense functions, and adaptive movements.

(*c*) A stage of representation in which appear memory, imagination, attention, and more complex motor co-ordinations.

(*d*) A stage of reflection, reasoning, unselfish emotion, and voluntary movement.

As an example of the application of child study to the special features of school life, the study of fatigue may be cited as having already led to important practical results. It has, for instance, emphasised the close relationship existing between mind and body by showing how the school work is influenced by the bodily condition of the children, by the amount they sleep, by the nature of their food, by the arrangement of their meals, by the purity of the air in the schoolroom,

[1] *Pedagogical Seminary*, 1898, page 511.

by the state of the weather, and so on. It is showing how fatigue may be diminished by a suitable arrangement of the school subjects with reference to one another, by proper methods of teaching, and by taking the most difficult subjects when the brain is freshest. If the mind is fatigued, the same amount of work cannot be done, and if an attempt is made to push the child, the work is apt to be done imperfectly with the result not only that it is soon forgotten but that bad mental habits are formed. Over-pressure is not due so much to over-work as to doing the wrong things at the wrong times and in the wrong way. The study of fatigue seems also to indicate that during periods of rapid bodily growth the amount of mental work ought to be diminished rather than increased. Such a period occurs, for example, between the seventh and ninth year, and is thought to be due to the rapidity of growth, and a temporary want of correlation between the muscular and circulatory systems. A similar state of affairs may recur a few years later. Many girls of fourteen are unable to undertake without over fatigue so much work as they could overtake at twelve. The amount of work must obviously be measured by the mental strain it produces, not by the number of pages to be learned, seeing that facility of execution and ability to bear fatigue have to be taken into account.

CHAPTER III

The Surroundings of the Child

It is not always possible to procure for the child the surroundings we should like, but the conditions really essential to physical health are comparatively simple, and their attainment usually easy.

The Hygiene of the Nursery.—The nursery should be a room of good size. A room at the top of the house possesses the advantages of quietness, good light, and purer air. Preferably it should be on the sunny side of the house,

even though an equally good room on the shady side should have a better view. The window space should be ample, and the windows should not be overshadowed by trees.

The floor should be covered with cork carpet or linoleum, or may be stained, in which case all the cracks between the boards should be carefully "filled." The floor should not be highly polished in case of accidents. A floor treated in this way can easily be kept clean by means of a damp cloth. It should be washed not oftener than once a week, and while it is drying the windows should be widely opened, and the children should be taken out.

Warming and Ventilation.—The nursery should be kept at a temperature of 60° F. In very cold weather the temperature should be a little higher, but should not be allowed to be above 65° F., unless very exceptionally in cases of sickness. In this country the room is usually warmed by means of an open fireplace. This method, although wasteful, possesses several advantages ; it is convenient, no impurities are added to the air of the room, and the draught which is created up the chimney acts as a powerful ventilator. Additional advantage of the fireplace as a ventilator is taken in the ventilating grates, such as Galton's, which are provided with an air-chamber behind the fireplace. An opening below admits fresh air from the outside to the chamber, where it is warmed, and then escapes into the room by an opening above the chimney-piece. The fireplace should be provided with a fire-guard which can be fixed in position, and which is too high to be easily climbed.

Few things are of greater importance for the child's health than that he should have an abundant supply of pure air. We have been hearing a great deal lately of a new cure for consumption, and this new cure consists in nothing more than this, that the patient should day and night be bathed in an atmosphere of fresh pure air. If fresh air be thus potent to cure disease, it must surely be equally powerful in preventing it.

The air of the nursery is vitiated by the respiration of its

inhabitants, by the burning of lamps, candles, night-lights, or gas jets, and by the dust that arises in the course of household wear and tear. The pollution of the air is not due solely or even chiefly to the carbonic acid which is added to the air as the result of respiration and combustion. The closeness of a badly ventilated room is due to organic matter which is given off along with water vapour from the lungs, and to a lesser extent from the skin. This organic matter is highly poisonous, and is the cause of the headache, lassitude, and sleepiness experienced when a room becomes close. When children are compelled to spend a large part of their lives in ill-ventilated rooms and to rebreathe these deleterious products of respiration they cannot but suffer in health.

In order therefore to keep the room fresh the air requires to be frequently renewed. As already mentioned, the draught of the chimney caused by the fire is a powerful ventilator, as air is continually being removed from the room, and being replaced by air from outside, and from other parts of the house. It is important to recognise the course taken by these currents of fresh air. Doors usually fit more tightly above and at the sides than at the bottom, where there is usually a considerable space under which a strong draught may pass along the floor in the direction of the fireplace. This draught may not be noticed by adults, but is a frequent cause of colds among children who are beginning to creep about the floor. It may be diminished when necessary by a mat placed outside the door, or, better, by a screen inside the room. The fresh air entering by the window tends to fall in a stream towards the fireplace. A well-known device for securing a freer current of fresh air consists in raising the lower sash and fitting under it in its whole width a board about five inches broad. Fresh air enters the room between the sashes and is directed by the lower sash towards the ceiling, so that a draught is obviated. In warm weather when no fire is needed, the damper of the grate should not be closed, as the chimney will still assist in ventilating the room. Every day, when the children are out, the room should be thoroughly flushed out

with fresh air by opening the windows widely top and bottom. This should also be done in the morning and again immediately before bedtime, if the room is used for sleeping in. The evening flushing is especially necessary if the gas has been burning in the room for any length of time. An ordinary gas jet consumes as much air as five or six people.

Fresh air is just as important at night as by day, and may be admitted directly from the outside by means of the device already mentioned. The greatest care must be taken to keep the crib out of the direct line of the draught; that is to say, it must not be within the lines joining the window, the door, and the fireplace. If additional protection is necessary, a screen, which should not be too high, may be placed between the crib and the window. In very cold weather fresh air may be admitted by leaving the door instead of the window open, and opening slightly a window in the passage or on the staircase. I see no objection to a small fire in the nursery at night in very cold weather provided the room is not allowed to get too hot, which it is not likely to do if there is ample ingress for fresh air. It is certainly better to temper the cold air of the room by means of a fire than to load the child with a heavy weight of bed-clothing which interferes with his breathing, and disturbs his sleep. Besides, in the latter case the child is apt to throw aside the bed-clothes or to crawl out from among them during his sleep, and so to expose himself to chill.

The ***walls of the nursery*** may be covered with smooth glazed paper, or may be painted. Glazed paper and oil paint catch little dust and can readily be cleaned with a damp cloth. Distemper painting is inexpensive and can be readily renewed. Rough papers catch so much dust that they are unsuitable for the nursery. Care should be taken that the paper is free from arsenic and the paint from lead. Cornices and mouldings are simply dust traps and should not be present in the room.

The ***furniture*** should be simple in character. Cane-bottomed or wicker chairs with moveable cushions are pre-

ferable to heavily upholstered articles because they harbour less dust. For the same reason the larger pieces of furniture should not be heavily carved. Wardrobes or chests of drawers, if present, should be on castors so as to be easily moved, but as such articles diminish the air space considerably they are better kept elsewhere if the room is not very large.

The nursery table should be of deal, or at any rate have a plain wood top, so that it can be scrubbed. A small low deal table, which the children can move about and on which they can amuse themselves with their toys, will be found very useful as a plaything. Indeed all the furniture of the nursery should be capable of being requisitioned in this way.

If the floor is polished or protected by cork carpet, one or two loose rugs or art squares will be sufficient additional covering. These should be of close texture and moveable, but should not slide about easily on the floor. Wool or hair mats or pile carpets are unsuitable.

A few good coloured prints in simple frames or even without frames are necessary to add to the cheerfulness of the room. They should not be too good to be destroyed when the room requires disinfection.

The cradle or crib should be without curtains or drapery which would interfere with the free access of air. The form of crib known as the hospital cot is very convenient as the sides can be let down. The mattress should be stuffed with good hair, and may be protected by placing over it a waterproof sheet while the baby is young. This should, however, be got rid off as soon as possible as it is very heating. The pillow should be small and thin.

A room furnished in this way can easily be kept clean. The walls and floor can be dusted with a damp cloth, and the rugs and cushions can be frequently shaken and beaten outside. All soiled linen and slops should be removed from the room at once. While it is convenient to have a bathroom and water-closet on the same floor there should be no plumbing of any description within the nursery itself. Even the outflow pipe from a basin may serve to admit sewer air to the room.

Disinfectants are to be used only if an infectious illness occurs. Under such circumstances all carpets, rugs, curtains, and as much of the furniture as is not required should be removed immediately to prevent contamination. When the time comes for disinfecting the room, toys, picture books, etc., should be destroyed, and the room repapered or painted.

The Nurse.—The proper choice of a nurse is obviously of the greatest importance, but it is impossible to describe in detail the qualities she should possess. To do so would be to enumerate most of the feminine virtues. But at least she should, in addition to possessing a character above suspicion, be strong, active, and free from disease. She should be cheerful, good-natured, gentle in speech and manner, neat and tidy in person and habits. Above all, she should be truthful in deed as well as word. As to age she should preferably be between twenty-five and thirty. As to experience she can bring no better recommendation than that she has been for some years nurse to a family where the children are such as you would like yours to be. In addition she must be fond of children and must not be afraid of hard work, for hard work it really is, though the children be the best in the world. And remembering what the nurse's work is, let her have privileges, and especially abundance of time off duty.

School Hygiene.—The subject of school hygiene, after long neglect, has of recent years attracted a considerable amount of attention, but even yet parents are not sufficiently alive to the importance of the question in their choice of a school. Only a few of the most important points can be referred to here.

Class Rooms.—Efficient ventilation is of the first importance. Fresh air is as necessary to a child as good food. No instruction gained in school can compensate for the ill-health or lowered vitality which result from living in an impure atmosphere. It is not easy to lay down rules as to the proper number of cubic feet per child, so much depends upon the arrangement of the room, and the means

of ventilation. The age and social condition of the children have also to be taken into account. Ragged and dirty children add more to the impurity of the atmosphere than those of a better class. Young children, also, by their restless habits stir up the dust, and so cause impurities to be on the whole more abundant in the air of the infant class rooms after use than is the case in the higher departments. That the amount of cubic space commonly prescribed for class rooms is too scanty is generally agreed. No greater mistake can be made than to suppose that the size of the children as compared with adults can be taken as a guide. Even healthy children, according to Sir John Simon, "in proportion to their respective bodily weights, are about twice as powerful as adults in deteriorating the air in which they breathe." Schools are frequently the chief means of disseminating an infectious disease in a district, and although even the best ventilation cannot eliminate this risk, bad ventilation must greatly increase its intensity. The amount of cubic space required in class rooms by the Education Department—120 cubic feet—is far too little even for the smallest children. Mr Charles E. Paget is of opinion that 400 cubic feet per scholar should be allowed in elementary schools and 800 in the great public schools. Cloak rooms separate from the class rooms should always be provided.

Authorities are not agreed as to the relative advantages of the principal systems of ventilation. A good system of artificial ventilation, *e.g.* by the propulsion by means of fans of a sufficient supply of filtered air into the class rooms at a suitable temperature, has often effected a great improvement in the purity of the atmosphere. But whatever system may be adopted the means of carrying out thorough natural ventilation by free opening of the windows should always be present. The system of carrying on some form of fresh air drill whenever the class room is to be vacated has a distinct educational value, to the teacher as well as to the pupils.

Lighting.—The windows should be of large size and

so arranged as to permit of cross-ventilation. They should extend up to within a few inches of the ceiling. The window sill may be higher than is usual in a sitting room, *e.g.* 4 feet or 4 feet 6 inches. The principal windows should be on the left hand side of the pupils as they are sitting. The pupils should never sit so as to face any of the windows.

Desks and Seats.—The best modern desks and seats are adjustable both to the size of the child and to the requirements of different occupations. The back of the seat should give support to the sitter's back by allowing for the natural curves. One good form of school chair has two supports, a lumbar and a dorsal, both adjustable for height. The vertical method of writing now coming into vogue allows of a better attitude than the old sloped method. The influence of attitude on maintenance of attention is very pronounced, hence it is important that the seating should be such as to render the attitude of attention comfortable. Teachers would do well to remember that fatigue is an important cause of faulty attitude, and that any attitude if long continued will cause fatigue.

Playrooms.—Where it is possible to provide playrooms these should be light and airy. Preferably they should be on the ground floor and communicate directly with the playground.

Boarding Schools.—Boarding schools include not only the large public schools but orphanages and other schools for special classes of children, schools under the Poor Law, reformatories, and numerous private institutions. The grossest hygienic defects in these institutions have arisen from the massing of large numbers of children together, whereby the general standard of health was lowered, and the spread of disease from one child to another was favoured. The great prevalence of ophthalmia and other diseases in certain of these buildings has led to the general condemnation of the system of barrack schools. It is also beginning to be recognised that it is only by the segregation of the children in comparatively small groups that they can obtain some of

the mental and moral advantages from which they are precluded by the want of any home life.

The Larger Environment.—One of the saddest features of modern civilisation is the sacrifice of infant life, which in some districts of the country is truly appalling. In healthy country districts the death-rate among children under one year is 80 or 90 per thousand, which seems a very high figure, yet in most of our large towns it is about 150, and in some of the more crowded industrial centres it reaches or surpasses the dreadful proportion of 200 per thousand. In Liverpool in 1899 the mortality among infants under one year was 242 ; in Preston in 1897 it was 262. This means that, of all the children born, one out of every four or five never reaches the age of one year. While a proportion of these deaths is unavoidable, quite a large percentage must be admitted to be due to preventable causes—perhaps the whole of the excess of the unhealthy over the healthy districts. And "if preventable, why not prevented?" as the Prince of Wales said with reference to tuberculosis.

Among important causes of death in young infants are prematurity of birth, bad hereditary tendencies, inexperience and neglect on the part of the mother, and industrial conditions, especially the employment of women in mills during pregnancy and shortly after child-birth. The children are sent out to nurse during the day, and are often fed on an innutritious and unsuitable diet instead of milk. Improper food and methods of feeding are also amongst the most potent factors in increasing infantile mortality. It is said that during the siege of Paris, when the general mortality was doubled owing to the sufferings and privations undergone, that of infants was reduced by 40 per cent. owing to the mothers being forced to suckle them.

The importance of guarding the milk supply from contamination by the germs of infectious diseases has been forced upon the attention of the local authorities by the occurrence of numerous epidemics which have been traced to milk infection. During the last year or two another aspect

of the milk supply has attracted a great deal of interest. Owing to the great extension of our large towns, a large proportion of the milk required has to travel a long distance from the country, and a considerable time has therefore to elapse before it can reach the consumer. In order to prevent the milk from turning sour, many dairymen have been in the habit of adding some preservative to the milk, and have maintained that such a practice did not constitute an adulteration, on the ground that the preservative used, usually boracic acid, was non-poisonous and harmless. To test the truth of this assertion Professor Boyce of Liverpool tried the experiment of feeding a number of kittens on milk containing ten grains of boracic acid in each pint. He found that the kittens underwent rapid emaciation and soon died. Kittens fed upon pure milk under the same conditions developed quite normally. Kittens fed on milk containing only five grains of boracic acid in each pint also emaciated and died. Experiments were also tried with a powerful antiseptic, formalin, which has lately been recommended as a milk preservative. Professor Boyce found that kittens fed on milk containing 1 part of formalin in 50,000 increased in weight by only 70 per cent. of the weekly gain of healthily fed kittens. There can be no reasonable doubt that these preservatives would have a similar effect upon infants.

The insanitary conditions and the overcrowding that too often attend life in a large town are responsible for many outbreaks of disease, and mean lowered health and loss of spirits for adults as well as children. Perhaps the greatest sufferers are the children who have survived the period of infancy, and who are subjected to slow poisoning by breathing impure air, and to slow starvation from improper more often than from insufficient feeding. Children in proportion to their size need more fresh air and food than adults. They need scope for the exercise of their activities. Their impulses are directed towards the exercise of their bodily powers. They should delight to run, to play, to climb, to shout, to laugh. But under the conditions of life in an

industrial town they are robbed to a great extent of the happiness and vitality which should be the prerogative of every child. When, if not in childhood, can any of us fully appreciate the spirit of Browning's words :—

"Oh, the wild joys of living! the leaping from rock up to rock,
The strong rending of boughs from the fir-tree, the cool silver shock
Of the plunge in a pool's living water, the hunt of the bear,
And the sultriness shewing the lion is couched in his lair.

. . . . . .

How good is man's life the mere living! how fit to employ
All the heart and the soul and the senses for ever in joy!"

However the lot of the town child may be ameliorated by improved sanitation, by the better inspection and regulation of the food and milk supply, and by the establishment of playgrounds and trips to the country, perhaps the best hope for the future lies in the establishment of cheap means of locomotion whereby a large proportion of the working classes will be able to move out to new districts, where it will be more easy to avoid the worst of the old evils, and where especially ample open spaces can be preserved for playgrounds, gardens, and parks. Even now it would be possible for far more people to live out of the large towns where they work did they realise the advantages that would accrue to the children by their doing so.

It is not only the children of the very poor who suffer from town life. They at any rate have the streets in which to play. But to the children of the well-to-do, and even of the respectable working classes, this has often to be denied, and it is not always possible to find a satisfactory substitute. In truth, there can be no substitute for free play in the open air with suitable companions, and there is no other way in which the young can so well build up a store of health and strength and energy. The custom of spending a month or two in the country every year is of course altogether advantageous and indeed essential, but cannot perfectly take

the place of a real country life, and probably we may agree with John Locke that the best place in which to bring up a young child is an honest farmhouse. The importance of a country life is especially great in the case of children who are delicate as the result of illness, or who have any inherited weakness of constitution. Nervous children, children who are always catching cold, and those who have any hereditary tendency to chest complaint, benefit greatly by an open-air life in a dry equable climate.

The physical advantages of a country life are greatly enhanced by the constant fund of interest and pleasure which Nature provides. Nothing can do more to add to the richness and value of life than a true and deep love of Nature, and this can best be awakened when the child is young. The inherent love of Nature doubtless differs greatly among children, but all children love to be out of doors. Many of the instincts which appear in children, for instance those which determine the particular form of play which for the time being seems most engaging, indicate unmistakably that an out-door existence is as it were intended for the child; and inasmuch as the function of such instincts in the child is not so much to minister to his bodily wants, which are provided for by his parents, as to form the starting-point of intellectual and moral habits, the importance of suitable scope for their exercise is obvious. Living things especially move the heart of the child, and long before he is old enough to appreciate the beauties of scenery he may know and love "the green things growing," and drink in those strong and deep impressions direct from Nature in a way we can never do in after life when

> "Nothing can bring back the hour
> Of splendour in the grass, of glory in the flower."

CHAPTER IV

The Care of the Infant

During the first few weeks of its life the infant should spend most of the time in sleep. It is better that even from the first it should not sleep beside its mother but in a crib of its own. If the infant shows any sign of feebleness of the circulation, such as blueness or coldness of the extremities, warm bottles wrapped in flannel should be placed near it, but not touching it. The cradle should be without rockers. The practice of rocking is unnecessary and sometimes harmful, and if it is indulged in the infant soon acquires the habit of not sleeping without it.

Care of the Eyes.—During the first few days the eyes should be washed after the bath with a solution of boracic acid. The eyes should be protected from too bright light, and when the child is asleep the room should be darkened.

Care of the Mouth.—It is often recommended that the gums should be washed with a little boracic acid solution and a piece of soft linen after feeding. This practice is hardly necessary in the case of strong infants, but if the child is delicate it may prevent the growth of thrush.

The Bladder and Bowels.—Some control of the bladder and bowels can be taught at a very early age. The infant should never be allowed to lie even temporarily with a wet napkin. If care is taken to change the napkin whenever necessary the child will soon learn to appreciate the comfort of dryness and will attract the nurse's attention by whimpering or other sign when a change is required. The baby should from the first be held out at regular periods—after its bath and after each feeding—and by the time it is a few months old it will have learned to make its wants known. When an accident does happen the child should not be scolded, as this will only frighten a nervous child and may increase the difficulty of control.

The Nervous System.—The nervous system of young children is very sensitive to outside impressions, and harm may readily be done by the influence of improper surroundings. It is especially important that the child should have abundant sleep, and that it should not be excited, especially near bedtime, by the attentions of too many admiring visitors.

Sleep.—For the first few weeks of life the infant should sleep twenty hours or more out of the twenty-four, waking only to be fed and bathed. The period required for sleep by children of different ages is shewn in the following table :—

Birth to four weeks . .	20-22 hours.
One to six months . .	16-18 hours.
Six months to one year . .	14-16 hours (11-12 hours at night and two naps by day).
One to two years .	12-14 hours (one nap by day).
Two to six years . . .	12 hours.
Six to ten years . . .	11 hours.
Ten to fifteen years . .	9-10 hours.

It is of great importance that the training of the child in proper habits of sleep should be begun at birth. This can usually be accomplished easily by attending to two points. First, the child should be accustomed from the very first to being fed at regular intervals *by the clock*, as explained in the section on feeding. Second, the child should be accustomed from the very first to being put into its cradle awake and left to go to sleep. If the child is well, its appetite satisfied, and its feet warm, nothing more is necessary to induce sleep than a warm and comfortable bed in a quiet, darkened room. I make the statement in this absolute form of young infants only, and I am assured by experienced nurses that they never find any difficulty in inducing a regular habit of sleep when they have the child to themselves, and if such a habit can be established it will render it more easy to prevent any methods of artificially inducing sleep subsequently resorted to from becoming tyrannous. Children certainly

differ considerably in the ease with which they fall asleep, and in older children the length of the day sleep, the time the child has spent out of doors, and the kind of play indulged in before bedtime all have a marked influence on the induction of sleep. The practice of hushing or lulling an infant to sleep is of considerable psychological interest. "The earliest cradles of the race were rocked in rhyme to sleep," and perhaps the evolutionist may seek to explain the soothing effect of rhythmical motion by reference to a greater antiquity than a mother usually has in mind when she is searching for family traits in her offspring. When one seeks for some advantage which may explain the continuance and universality of a practice so troublesome, it may be suggested that the rocking and the mother's lullaby are amongst the earliest waves that break upon the child from the sea of feeling in which he finds himself, and that, associated as these are with the earliest dawn of consciousness, they help to awaken and strengthen the emotional links which bind mother and child together. Here, it may be, is laid the foundation of that heightened emotional sensibility, which, in adults as well as children, so often attends the falling darkness of the "solemn evening hour" when the mother finds her child's confidence most completely hers.

If the child requires to be wakened this should be done very gently. If the child is shaken or spoken to in a loud tone, it may waken up startled or frightened, and a nervous baby may even be thrown into convulsions. It is wonderful how soon most babies get into the habit of waking at the proper time for their drinks if these are given with regularity.

The Skin.—The skin of the infant requires care not only because it is an exceedingly delicate structure, but because it possesses such active excretory functions that it has been aptly described as the most important gland in the body. The chief factors in preserving its healthy activity are bathing and clothing.

Bathing.—A baby should have one bath every day, and if strong he may have two. The temperature of the bath

should be about 90° F. at first and should be tested by means of a bath thermometer. As the baby grows older the temperature of the bath may be gradually lowered, but until he is a year old should not be under 80°. Strong babies and older children may be quickly sponged over with tepid or even cold water after the morning bath. This is best done by means of a large sponge while the child is sitting in a little warm water. Care must be taken that the room is sufficiently warm, and that the skin has not been chilled by the child's playing about with insufficient clothing. The healthy glow of the skin when it is rubbed dry is a sign that the bath is doing good.

During the first few months the baby should be carefully sponged with soap and water (and a flannel), on the nurse's lap, then gently placed in the bath and quickly sponged over till all the soap is removed. It should then at once be taken out and quickly and thoroughly dried with a soft warm towel. Only a perfectly pure soap should be used, and it should not be used too freely. An overfatty soap should be used if the skin is delicate. A separate small sponge should be kept for the face. If the skin is thoroughly dried especially in the folds and flexures powder will be hardly necessary; if used, it should not be perfumed.

Sea Water Baths.—Salt water baths are more stimulating than fresh, and are good for children of all ages. A handful of rock salt may be added to every gallon of water. Sea-bathing may be allowed when the child is six or seven years of age. The best time for a bathe is about three hours after breakfast. The head should be wetted first, and five minutes is long enough for the child to stay in at first. If the water is cold he should not be allowed to stay in so long. After bathing he should be rapidly and thoroughly dried with a rough towel, dressed, and sent for a run.

Clothing.—To the male intelligence the ordinary methods of clothing an infant appear very cumbersome and inconvenient, occupying a needless amount of time and involving a repeated turning about of the child upon its face and back again. Many

improvements have been introduced into the art, but these seem slow to find their way into the nursery. The essential points are that the clothes should be warm without being heavy; that they should not confine the movements of the child in any way; and that they should be so made that the child can be easily and quickly dressed and undressed. Excess in clothing is indicated by too profuse perspiration so that the underclothing becomes damp. Deficiency of clothing is indicated by coldness of the extremities and signs of discomfort by the child. Damp underclothing *and* cold feet indicate an improper distribution of the clothing, one of the commonest faults in the dressing both of infants and older children.

In practice the methods of dressing babies vary quite legitimately to such an extent that it is possible here to do no more than give a few hints in the hope that some of them may be useful.

The binder should be of the softest flannel, and should not be too long. It is usually bound, but probably the baby's delicate skin would be quite as comfortable if the binding were omitted. It should be applied smoothly and not too tightly, and fixed with safety pins or stitches. Worsted is better than cotton for this purpose as a few large stitches can be passed very quickly and will not readily slip. Some medical men recommend the omission of the binder on the ground that it restricts the movements of the child's muscles, prevents proper expansion of the chest, and weakens the wall of the abdomen. This charge may be quite legitimate in cases where the binder has been improperly applied. The use of the binder is to act as a safeguard during the great strain which is thrown upon the abdominal wall whenever the child cries, and during severe attacks of coughing. Until the navel is perfectly healed it would not be safe to do without this protection. Care should be taken that the binder is not drawn too tight. It ought to be applied just sufficiently firmly to press upon the abdomen and support it when it is distended and strained during crying. It ought not to be so broad as to impede the movements of the chest.

The other garments worn by the child should be so made as to be easily and quickly put on and taken off, so that the child may not be needlessly wearied and irritated by the process. The sleeves should be provided with very wide inlets to make it more easy for the nurse to insert the baby's arms. If the baby is at all feeble it is an advantage to have the garments made to open widely, and all to button or tie in front or behind. They can then be arranged in their proper order one inside the other prior to dressing, and the baby can be slipped into them all at the same time. The dress and petticoat should not be so long or so heavily frilled as to be a burden to the child when it is taken out. For going out the baby ought not to be worried by being partially stripped and redressed, but should simply be dressed in such additional clothing as may be necessary.

The child is usually shortened at the age of two or three months. There should be no hurry in discarding the binder if the child is delicate, if it cries a great deal, or if it suffers from a cough. Care should be taken that the lower part of the body is sufficiently protected so that the baby may kick about freely without danger of catching cold.

In the case of older children the same general rules as to clothing apply. The under garments should always be woollen and of loose texture. The body and limbs should be completely clothed. Stockings should be long and suspended from some garment above. Garters or constricting bands of any sort should not be allowed. Bare legs or knees should be permitted only in very hot weather. The weight of the clothing should be borne by the shoulders, not by the waist. Shoes should be rights and lefts and should be sufficiently stout to protect the feet from cold and damp. Drawers should be worn even by very young children, who, indeed, from their habits of sitting and creeping on the floor especially need this protection from draughts and dirt. The nightdress should always be of a woollen material, and a thin knitted woollen shirt may be worn under it if considered necessary, or a woollen spencer may be worn over the nightdress.

No greater mistake in the clothing of children can be made than to attempt to harden them by under clothing. If a child is insufficiently clad it is not only liable to catarrhal attacks which may produce a susceptibility to more serious disease, but the nervous energy is exhausted in striving to make up for the excessive loss of heat, with the result that the child becomes peevish and irritable, and its nutrition suffers gravely.

Airing.—The age at which the baby may be taken out for the first time will depend chiefly on the season and the state of the weather. At first an airing of fifteen or twenty minutes is sufficient, but as the child grows the time should be gradually increased. For the first two or three months it is better for the child to be carried out, especially if the weather is cold; afterwards it may be taken in a perambulator, in which it can lie. It should be protected from bright sunlight and from cold winds. Even in cold weather the baby may be taken out if the sun is bright and there is not too much wind, but in very windy or wet weather it may be taken for an airing in a large room whose windows have been open for some time. This is also useful before taking the infant out for the first time in order to accustom it to change of temperature. When the baby is old enough to sit up in its perambulator it should be provided with cushions to support its back when it gets tired. It is of considerable importance that the baby carriage should have very easy springs so that the child may not be jolted in passing over stones or over the kerb.

Exercise.—The infant obtains exercise for its muscles in crying, kicking, grasping, in being carried about by the nurse, in being turned about in the crib, bathed, dressed, taken out. By the time he is three or four months old he should be allowed to kick about on a rug or in a large bed. Older children should have abundant exercise in a cool playroom or out of doors. As to walks in bad weather there are very few days indeed when it is unsuitable for children who are past babyhood to be out of doors, provided they are properly clothed and are in active movement all the time they are out.

In very cold weather the important points to attend to (in addition to clothing) are that the child is warm, but not overheated, before going out, and that he is not allowed to stay out till he is tired. It is a mistake to send a chilly shivering child out "to get warm." Let him have a good romp first for five minutes with the skipping rope, be he boy or girl, and a biscuit, and then he will be able to face the cold. Rain will do no harm if the wet things are changed on coming home. A child who is suffering from even a slight cold should not be sent out in doubtful weather, as a further chill is then readily caught.

Food and Feeding.—A child can have no better start in life than a few years of uninterrupted health, and among the conditions necessary to obtain this none are of greater importance than proper methods of feeding. The superiority of human milk over all other foods for infants, from the point of view of digestibility and of nutritive value, is proved by accumulated experience and is acknowledged by all authorities on the subject. Our knowledge of the principles upon which must depend the successful rearing of "bottle babies" has indeed advanced greatly in recent years, but even yet artificial methods of feeding have to bear even graver charges than their liability to produce indigestion and colic in the unfortunate infants who have been deprived of their mother's milk; for a well-known medical authority, speaking on this subject recently in an after dinner speech, quotes a collective investigation on the future of bottle-fed babies as showing "that intellectual obliquity, moral perversion, and special crankiness of all kinds result directly from the early warp given to the mind of the child by the gross and unworthy deception to which it is subjected—a deception which extends through many months of the most plastic period of its life."

The Times for Feeding.—The nursing infant should be fed at definite times for two reasons. The first is that regular feeding begins the training of the child in regular habits, and especially aids the habit of regular sleep; the second is that irregularity in nursing disturbs the quality of

the milk. Too frequent nursing is apt to render the milk indigestible. Too prolonged intervals are apt to render the milk thin and innutritious.

The new-born child should be put to the breast within a few hours of birth, and thereafter at intervals of three or four hours until the flow of milk becomes established. From the third day till the sixth week the breast should be given at regular intervals of two hours during the day. At night one or two feedings should suffice between 10 P.M. and 6 A.M., and although the baby may at first awaken more often than this every effort should be made to accustom it to doing without a drink for four or five hours at a stretch at night. After the first six or eight weeks the intervals between the feedings should be lengthened to two and a half hours, and after two months more to three hours. After the sixth month the baby should sleep six or seven hours at a stretch at night.

The Composition of Human Milk.—Milk is an emulsion which owes its white colour to the presence of fat in the form of minute globules. The average composition of human milk contrasted with cow's milk is shown in the following table :—

	Human Milk.	Cow's Milk.	Cream.
Fat, . .	4	3·4	8 to 20
Sugar, . .	7	4·3	4
Proteids, . .	1·5	4	3·4
Salts, . . .	0·2	0·7	0·6
Water, . .	87·3	87	84 to 72
	100·0	100·0	100·0

It will be noticed that human milk contains more sugar and less proteid than cow's milk. Cream has practically the same composition as the milk from which it is obtained, except that it contains a larger percentage of fat, and a proportionally smaller percentage of water. Cream containing 8 per cent. of fat, usually called 8 per cent. cream, is thin cream such as

has risen to the surface of milk standing in a cool place after five hours. Twenty per cent. cream is moderately thick cream obtained by the centrifugal separator. An even higher percentage of fat is sometimes found. Dr Still recently examined nineteen samples of centrifugal cream obtained in London, and found an average of as much as 48 per cent. of fat.

There is a more important difference between human milk and cow's milk than the difference in percentage composition shown in the table. This lies in the character of the proteid matter. In each case the proteids are composed of a mixture of albuminoid substances, but in cow's milk the principal proteid is casein which in the child's stomach gives rise to a firm dense curd, while in mother's milk the principal proteid is a form of albumin which gives rise to a loose, flocculent, and more easily digestible curd.

In order that the mother may have a good supply of milk, she should have a plain, nutritious, and abundant diet in which milk has a considerable share, and as soon as possible she should have a sufficient amount of outdoor exercise daily to preserve her own health and digestion. She should practise good habits of nursing from the outset. It is of the greatest importance that she should have a quiet undisturbed night. The baby should never be allowed to go to sleep at the breast, nor should it sleep in the same bed as its mother. Occasionally the mother's milk does not agree with the infant, even although the rules for nursing are being attended to. If the milk is too rich, as it may be in the case of strong healthy mothers who have good appetites and take little exercise, the baby is apt to suffer from indigestion and colic. The milk in these cases can often be made to agree if the mother slightly reduces her diet, takes more exercise, and nurses the baby at somewhat longer intervals. Occasionally some special article of diet, especially wine or beer, may be to blame for the indigestion. A more common fault is for the milk to be poor in quality. This may be shown in many ways, especially by the failure of the infant to gain weight

steadily and sufficiently. If the insufficiency is only slight, a more generous diet and especially a larger supply of meat, aided possibly by tonics and more abundant fresh air, may put matters right. If not, the breast-milk may be supplemented by the use of some suitable infant's food, but the baby ought not to be weaned if it can be avoided.

Contra-indications to Nursing. — The principal contra-indications to nursing are absence of breast milk; delicacy of the mother so that the strain of nursing is too great; the existence in the mother of some infectious disease such as consumption. The milk of very nervous women, and especially such as are given to worrying, will sometimes disagree to such an extent as to contra-indicate nursing.

Wet-Nursing.—When maternal nursing is impracticable the child must be brought up by artificial feeding or by wet-nursing. Wet-nursing is seldom necessary, but may be the only means of saving the life of a very delicate infant. Even in such circumstances it is seldom necessary to retain the services of the nurse for more than two months. The nurse must of course be healthy and have a good supply of milk. While there should not be too great disparity between the ages of the children, on account of the changes which take place during lactation in the composition of the milk, it is better that the nurse's child should be the elder by six or eight weeks. The condition of the nurse's child will then show whether her supply of milk is sufficient in quantity and of good quality, and in addition her child will be less likely to suffer from the want of his mother's milk than if he were hand-fed from the outset.

Weaning.—The process of weaning should take place when the child is about ten months old, or earlier if the child is not thriving and gaining weight. It should be carried out gradually and will be all the more easily effected if the baby has been accustomed, from the age of four or five months, to having at least one feeding a day from the bottle.

Artificial Feeding.—Of the numerous methods of artificial feeding the best, and the only ones we need consider

in any detail, are those which make fresh cow's milk their basis.

The main difficulty in the use of cow's milk lies in the amount of proteid present and in the density of the curd, which is a great tax on the infant's power of digestion; and the younger the infant the more this tax is felt. The amount of proteid can readily be reduced by dilution with water; or with barley water, which often renders the milk more digestible, apparently by preventing the curd from being so dense as it would otherwise be. Mere dilution of the milk with the addition of sugar is sometimes sufficient preparation. More often by the time the milk has been diluted sufficiently to render the proteid digestible the amount of fat has been too much reduced, and it is therefore necessary to add a sufficient quantity of cream (see the tables of the composition of milk and cream on page 42). By mixing together suitable proportions of milk, cream, and water, and adding the proper quantity of sugar, it is possible to produce a modified milk containing whatever percentages may be desired of proteid, fat, and sugar. In several large towns in America and in England milk laboratories have been established for the purpose of supplying milk modified in accordance with the prescription of the physician. The milk properly modified is sent out daily in the necessary number of feeding-bottles each containing the quantity required for one meal.

The home modification of milk has to be carried out in a less elaborate manner. For example a mixture whose percentage composition closely resembles that of mother's milk can be made by mixing together one part of fairly thick (16%) cream, two parts of milk, and three parts of water or barley-water, and adding one ounce of milk sugar to each pint. If ordinary white sugar is used, rather less should be added. For very young infants a mixture such as the above may require to be still further diluted.

Another very useful method of modifying milk at home has been described by Dr Meigs. A quart of fresh milk is poured into a tall vessel and left to stand in a cool place for

three hours, by which time the greater part of the cream will have risen into the upper half of the milk. The lower half of the milk is then to be run off through a tap in the bottom of the vessel or may be syphoned off. The milk left is now to be made up to the original bulk, or less by the addition of water, and milk sugar is to be added in the proportion of an ounce to each pint. Dr Meigs also recommended the addition of lime water to the extent of one part in four of the mixture. I prefer to have the mixture made as described and sterilised, a sufficiency of lime water being added to each bottle as it is used.

Condensed milk suitably diluted is easily digested by young infants and has the advantage of being easily prepared and of being practically sterile. Even the best brands, however, are insufficiently nutritious, and therefore should not form the sole food of an infant for more than a few weeks.

Sterilisation.—When milk can be obtained which is fresh, pure, and clean, the process of sterilisation is unnecessary. As milk reaches the consumer, however, it swarms with micro-organisms, the most dangerous of which, on account of their almost universal presence, are those which are concerned in the causation of the various forms of infantile diarrhœa. The danger of infection by the germs of scarlet fever, diphtheria, or typhoid fever is also by no means inconsiderable. Infection with tuberculosis doubtless occurs occasionally through the milk, but this particular danger has certainly been exaggerated.

The simplest method of sterilising milk is to boil it, or as this alters the taste of the milk and somewhat diminishes its nutritive value, the method of pasteurising or sterilising at a low temperature may be substituted. This consists in heating the milk to a temperature of 167° F. and maintaining the temperature for twenty minutes. The sterilisation obtained is less complete than that which results from boiling, but is quite sufficient for ordinary purposes, if the milk is to be used the same day. There are many excellent sterilisers in the market. One of the best is Soxhlet's, in which the

milk is sterilised in a number of bottles each of which contains a sufficient quantity for a feeding. A simpler and less expensive method is to place the milk or the modified milk mixture in a large glass flask or bottle, or in a tin, and to place this in a pan of cold water so that the water comes up to the level of the milk. The pan is placed on the fire and the water is allowed slowly to come to the boil and to boil briskly for five minutes. Having been set aside for ten minutes the flask of milk should be stoppered, cooled rapidly, and kept in a cool place.

The Bottle.—The best bottle is that which can be most readily cleaned. It should be graduated in ounces, and should be provided with a teat which can be turned outside in and scrubbed. The ordinary tube bottles are objectionable because it is practically impossible to keep the interior of the tube clean. The baby ought to be carefully fed with the bottle, and should take from fifteen to twenty minutes over a meal. The bottle should then be taken away from him, emptied, and thoroughly cleaned, after which it may be kept in cold water in which a little boracic acid has been dissolved, until it is again required.

The amount of milk required for each feeding for twenty-four hours is shown in the accompanying table :—

Age.	At each Feeding.	In 24 hours.
1 week, . .	1-1½ oz.	10-15 oz.
1 month, . .	2½ oz.	25 oz.
3 months, . .	4 oz.	32 oz.
6 months, . .	6 oz.	36 oz.
9 months, . .	7 oz.	42 oz.
12 months, . .	8 oz.	40-48 oz.

The Use of Food other than Milk.—By the time the baby is seven or eight months old some additions may be made to the diet, but there should be no hurry in doing so if the child seems satisfied and is steadily gaining in weight. Still the use of some form of starchy food, such as oat flour, or of one of the proprietary infants' foods, once or twice

daily, is often advantageous, but there must be no diminution in the amount of milk given.

Infant foods are nowadays used to such an enormous extent that some of their features must be briefly referred to. Most of the foods of this class have the advantages of being easily prepared, easily digested, and readily taken. Practically all of them, however, are greatly deficient in fat, and many of them contain a considerable percentage of starch. Their nutritive value is greatly inferior to properly prepared cow's milk, and although many of them may be of considerable value for temporary use, there can be no doubt that when continued for a prolonged period as the exclusive diet, they are frequently the cause of rickets or of infantile scurvy.

The most commonly used infant-foods may be grouped as follows:—

1. Milk Foods: Allen & Hanbury's Food, No. 1 and No. 2; Nestle's Food.
2. Malted Foods: Allen & Hanbury's Food, No. 3; Horlick's Malted Milk; Savoury and Moore's Food; Mellin's Food. These foods are prepared from flour which has been malted so as to convert the starch wholly or partially into soluble carbohydrates.
3. Farinaceous Foods: Ridge's Food; Robinson's Patent Barley; Scott's Oat Flour.

Diet between the Tenth and Eighteenth Months. —During this period the diet should still be chiefly composed of milk, and should include about two pints or two and a half pints of fluid per day. The milk may still be slightly diluted by adding one-fourth or one-fifth part of barley water or thin gruel made from oats, wheat, or barley. Other forms of food should be used in moderation as an addition to, not as a substitute for, milk. Porridge now becomes an excellent article of diet. It should be made of the medium oatmeal, thoroughly cooked, and eaten with milk. Porridge made of coarse oatmeal, rolled oats, or Quaker oats is not at all

suitable for young children. Farinaceous puddings, bread and milk, rusks, soups thickened but without vegetables, are all suitable. Eggs lightly cooked are extremely valuable, and highly nutritious. Ripe or cooked fruit may be given occasionally towards the end of this period, but should be admitted with great moderation, and all skins, seeds or stones must be excluded with great care.

Diet for Older Children.—Till the end of the second year the child should have about two and a half pints of fluid daily, as in the last period. This may be given in five feedings. The other foods mentioned may be gradually increased in amount, and in addition a little fish or chicken or an egg may be given at the mid-day meal.

From the third to the sixth year four meals should usually be given daily, the first and the third being more substantial than the others. The diet should be light, varied, and palatable. It should include a large amount of milk. Meat should be included once a day. Salted and preserved meats, new bread, most green vegetables, nuts, pastry, and preserved fruits should be excluded from the diet.

During school life children require a very abundant diet. Meals should be given at regular times, and the children should neither be allowed to dawdle at them nor to scramble through them. As a rule some animal food should be given twice a day, and the two more substantial meals should not come too close together. The childish love of "goodies" should be met by including a fair amount of sweet things in the diet, especially in the form of cooked fruit such as stewed or roasted apples, or stewed prunes, or ripe fruit such as grapes, oranges, or pears. Sweetmeats are best allowed as an addition to meals. Chocolate is one of the best forms. The late Dr Milner Fothergill used to recommend toffee when made at home with the best sugar and butter. So made it is not merely a "goodie," but an excellent article of diet, supplying both sugar and fat. While children should be encouraged to eat the fat with their meat, they should not be compelled to consume greasy articles of diet. Fat is most

readily taken and most easily digested in the form of milk, cream, and butter. Jam or jelly should be given in moderation as an addition to bread and butter, not as a substitute for the butter. At any rate the old nursery rule, "butter with the first piece," should be adhered to. The diet of all young children should be very plain and simple in character. "Tasty" articles should be excluded entirely, if for no other reason than that they are apt to make the children discontented with the plain and wholesome food with which they are perfectly satisfied so long as they have never had anything else.

When children show any disinclination for wholesome articles of diet, this should not be too readily yielded to, as the sense of taste is easily trained to like almost anything that is taken habitually. This is especially important in the case of milk for which children leaving babyhood sometimes show a distaste. However, it is not wise to insist on more than a small quantity of the food objected to being taken. If a large quantity is given the sense of disgust is apt to be intensified.

CHAPTER V

The Growth of the Child

A HEALTHY infant at the time of birth weighs some seven pounds. It should be vigorous and well nourished, as evidenced by its warm extremities, the comfortable rounded contour of its limbs, its lusty cry. Its limbs move about freely, and its hands will close with some firmness on anything placed within their grasp. All its movements, however, are quite aimless. It cannot sit without support, and its head falls limply to whatever side the child is turned upon. The eyelids are only half opened. The eyes are quite expressionless, and often move independently, so that the child appears to squint. The shape of the infant differs considerably from

that of the older child. The head is relatively very large, and its circumference is greater than that of the chest. The face is small compared to the rest of the head. The trunk is relatively long compared to the limbs, the abdomen is large and protuberant, and the chest is small. The arms are relatively very large as compared with the legs. The changes in proportion which take place with growth have been pointed out by Quetelet. In the adult the head is double the height of the head at birth, while the trunk is three times, the arms are four times, and the legs five times the length of the corresponding parts at birth.

Weight.—During the first few days of its life the infant loses a few ounces in weight. This loss is usually made up by about the middle of the second week, and after this time there should be a steady gain in weight. A daily or weekly record of the baby's weight is often very valuable, for loss of weight, or even failure to increase, may be the first indication of the onset of some illness, or may shew that the infant's food is not sufficiently nourishing days or weeks before this would be evident in the appearance of the child. The weighing can very readily be carried out by laying the baby, when stripped for its bath, upon the pan of a spring balance.

The daily increase in weight should average $\frac{2}{3}$ to 1 ounce for the first five months, and $\frac{1}{3}$ to $\frac{3}{4}$ ounce for the rest of the first year. At the age of four or five months the baby's weight should have doubled; at the age of twelve months it should have trebled. After the age of one year the increase in weight is less steady. It is usually about six pounds in the second year, four and a half pounds in the third year, and about four pounds a year for some years afterwards. Between the eighth and the eleventh year the increase averages about six pounds a year. Up to this time the boys weigh more than the girls, but now the girls increase in weight more rapidly and pass the boys, who do not overtake them until the fifteenth year.

Height.—At birth the infant measures about twenty inches in length. The growth in length is especially rapid during the first two or three months. At the end of the first year

the infant has increased eight inches in height, yet it is not till the sixth year that the child attains to double the height he had at birth. Boys grow slowly from seven to thirteen, when a rapid acceleration in the rate of increase takes place and continues till the seventeenth year, when it drops to a slower rate than before. In girls a similar increase occurs at an earlier period, from twelve to fourteen, but the rapid increase in weight continues till fifteen or sixteen.

The increase in height in young children is much less useful than the increase in weight as an index of physical well-being.

Table shewing the Weight and Height from Birth to the Fifteenth Year.[1]

Age.	Boys.		Girls.	
	Height.	Weight.	Height.	Weight.
Birth	20·6 inches	7·55 lbs.	20·5 inches	7·16 lbs.
6 months	25·4 ,,	16·0 ,,	25·0 ,,	15·5 ,,
12 months	29·0 ,,	20·5 ,,	28·7 ,,	19·8 ,,
18 months	30·0 ,,	22·8 ,,	29·7 ,,	22·0 ,,
2 years	32·5 ,,	26·5 ,,	32·5 ,,	25·5 ,,
3 ,,	35·0 ,,	31·2 ,,	35·0 ,,	30·0 ,,
4 ,,	38·0 ,,	35·0 ,,	38·0 ,,	34·0 ,,
5 ,,	41·7 ,,	41·2 ,,	41·4 ,,	39·8 ,,
6 ,,	44·1 ,,	45·1 ,,	43·6 ,,	43·8 ,,
7 ,,	46·2 ,,	49·5 ,,	45·9 ,,	48·0 ,,
8 ,,	48·2 ,,	54·5 ,,	48·0 ,,	52·9 ,,
9 ,,	50·1 ,,	60·0 ,,	49·6 ,,	57·5 ,,
10 ,,	52·2 ,,	66·6 ,,	51·8 ,,	64·1 ,,
11 ,,	54·0 ,,	72·4 ,,	53·8 ,,	70·3 ,,
12 ,,	55·8 ,,	79·8 ,,	57·1 ,,	81·4 ,,
13 ,,	58·2 ,,	88·3 ,,	58·7 ,,	91·2 ,,
14 ,,	61·0 ,,	99·3 ,,	60·3 ,,	100·3 ,,
15 ,,	63·0 ,,	110·8 ,,	61·4 ,,	108·4 ,,

[1] The figures are quoted from Dr L. Emmett Holt ("Diseases of Infancy and Childhood").

The Alimentary System.—The principal peculiarities of the digestive organs in the infant are the absence of teeth, and the inability to digest starch. For the first ten or twelve months the child should really be a suckling, receiving Nature's food in Nature's way. At birth and for some time afterwards the saliva is very scanty, and it is not till the teeth are appearing that the power of digesting starch is developed to any extent.

Teething.—The milk-teeth at birth are already present in the gums. Dentition usually begins when the infant is about six months old. The first teeth to appear are the lower central incisors. The upper incisors appear between the eighth and tenth months. The other two lower incisors, and the first molars, appear between the twelfth and fourteenth months, so that the baby by this time should have twelve teeth. After an interval the eye teeth are cut at about the eighteenth month. Then there is a longer interval before the second molars complete the milk-teeth at the age of about two and a half years.

The second dentition begins at the sixth year by the appearance of the first molars of the permanent set, often called the sixth year molars. The appearance of four teeth per year till the twelfth year completes the second dentition with the exception of the wisdom teeth, which do not usually appear till between the seventeenth and twenty-fifth years.

The proper care of the teeth is of the utmost importance to the well-being of the child. The milk-teeth ought to remain white and hard with no sign of decay until their roots become absorbed, and they drop out to make room for the permanent set. Early decay of the milk-teeth is frequently associated with improper diet, and is often one of the results of rickets. As the teeth are usually late of appearing in these cases, it would be well to consult the family doctor whenever the milk teeth fail to make their appearance at tne proper time. It has recently been alleged that the constant sucking of the dummy-teat or "comforter," in which so many infants are encouraged to indulge, inter-

feres with the proper growth and development of the jaws and consequently of the teeth. Thumb-sucking may also cause malposition of the incisors. Nevertheless, when the gums are actually causing irritation, it often gives the child great relief to be allowed to suck an indiarubber ring, or even his thumb, but great care should be taken not to allow such practices to become habits.

When the teeth appear they ought to be kept very clean. This may easily be done at first by washing them gently with a little water and a soft brush. As soon as the child is old enough he should be taught to use a tooth-brush regularly. The tooth-brush should be very soft so as not to injure the gums. An alkaline tooth-powder which is not gritty may also be used.

Decay of the teeth is favoured by indigestion, by the use of acid medicines or acid fruits, or by injudicious indulgence in sweet things which probably injure the teeth by undergoing lactic fermentation in the mouth, and indirectly by causing indigestion and acidity. If caries should attack any of the teeth, even of the milk set, the child should at once be taken to a dentist for treatment lest other teeth should become affected. Caries of the permanent set usually begins in childhood, and early treatment will do much to prevent trouble in after life.

A further reason for the systematic treatment of dental caries is this. Every cavity in a tooth is really an ulcer, and lodges the organisms which produce suppuration. Consequently every carious tooth is a possible source of blood-poisoning. The actual danger of blood-poisoning from this source is perhaps not great as long as the child is in good health, although even then it is by no means hypothetical. But if the child's powers of resistance are lowered by an attack of illness the danger may become considerable, and indeed it is now well known that many of the most serious complications of such diseases as diphtheria and scarlet fever, and many of the most trying symptoms of tubercular disease, are not due to the special organisms causing these diseases,

but to a secondary infection of the system by these suppurative organisms, or their products.

Teeth, like other organs, are the better for exercise. Children should therefore be made to eat their own crusts. Their diet should not be too largely composed of mince and fish and puddings, but should contain a fair proportion of articles which require to be chewed, remembering, however, that the child's powers of mastication are not very good. The habit of chewing even soft food is an important aid to digestion, a process which is too often expected to begin in the stomach instead of in the mouth as Nature intended.

Any disturbance of the digestive functions is of importance, because it interferes in proportion to its severity with the nutrition of the child. An acute disturbance, such as an attack of indigestion due to improper diet, attracts attention quickly by producing such symptoms as vomiting, pain, or diarrhœa. But a chronic interference with nutrition due to some delicacy in constitution, or to an unsuitable or insufficient diet, may fail to be noticed for a considerable period, unless regular weighing of the child is being carried out. Disturbances of the digestive system are not infrequently brought about by cold, by wet feet, or by insufficient clothing of the lower part of the body.

The regulation of the bowels is of the highest importance for the preservation of health, and the mother should see that regular habits in this respect are carefully cultivated.

Respiration and Circulation.—The lungs of the child begin to expand with his first cry. They are relatively small in early life, and are said not to attain their full expansion forwards until the age of five or six years. In order that the child may have strong healthy lungs, the first requisite is abundance of active exercise in the open air. When he runs about, the breathing becomes not only quicker but deeper, so that fresh air is drawn deeply into the lungs, and the active movements of the chest and of the diaphragm greatly aid the increased action of the heart. The chest type of breathing which is characteristic of women is pro-

bably, to a considerable extent, associated with the nature of their clothing. When growing girls are indulging in active exercise their dress should be loose and comfortable, and they should wear no corsets. Indeed it would be an advantage if these articles could be discarded altogether during childhood. They not only compress the abdomen but fix the lower part of the chest and impede the action of the diaphragm, and thus not only make respiration more difficult, but throw a greater strain upon the heart whenever the girl is moving actively.

Children should be allowed to exercise their voices freely, as Nature prompts them to do. Singing and reading aloud are excellent exercises both for the voice and the lungs.

The Nervous System.—The head of the newly-born child, as has been stated already, is very large comparatively to the rest of the body, and as the face is very small the size of the head is really due to the brain case. The brain of the newly-born infant may indeed be spoken of as relatively enormous. The proportion to the rest of the body is stated to be six times as great as is the case in the adult. The convolutions are not fully developed at birth, their fuller development being in fact largely dependent on the flood of sense impressions which now begin to reach them. The brain continues to grow very actively in size until the child is seven years old, the period of greatest rapidity being the first year. After the seventh year increase in weight continues very slowly till adult life.

The rapid increase in the size of the brain is connected with a peculiarity in the skull which may be mentioned here. The part of the skull which forms the brain case is made up of eight separate bones, which in the adult are very closely united together. At the time of birth these bones are only partially developed, and at several places there are distinct intervals between them. The largest of them is situated on the top of the child's head and is called the fontanelle, or popularly the opening in the head. As the bones grow this is gradually filled up and is usually closed

about the twentieth month. Delay in closure may indicate that the brain is still growing actively, but is more often a sign of some disease such as rickets.

The growth of the brain is not merely an increase in size. Before birth the impressions reaching the brain from the outside world are few in number and chiefly tactile, a mere rivulet of sense impressions compared to the flood which begins to pour in from all sides and through all the organs of sense as soon as the child enters the world. It is by the influence of this ingoing stream that a great part of the cortex of the brain is stimulated to develop. Those areas which receive impressions from the senses store up the memory of sense impressions. The part of the cortex concerned in the movements of the body likewise undergoes rapid growth, and we find the feeble inchoate movements of the infant gradually attaining definiteness and power.

As those sensory and motor areas develop there is gradually laid down also a series of what are called association fibres, by which the different areas of the brain are brought into relation with one another. Some of those are definite strands of nerve fibres whose course we can trace from place to place, but in addition to these there appear in time to be worked out more or less definite paths of association, which we may speak of as physiological, through areas of the cortex in which no beaten paths can be discovered by the microscope.

When the extreme complexity of these processes is considered, it is easy to understand how it is that many nervous diseases are common in childhood. The nervous system is very unstable and excitable, and the power of control is very deficient. Hence the screaming fits, the outbursts of passion, the severe headaches, the convulsions which often result from trivial causes, such as in the adult would produce no appreciable effect. In order that normal development of the nervous system may take place the child should be shielded as far as possible from all unnatural excitement, the diet should be as simple as possible, and especially should all stimulants, including tea and coffee as

well as alcohol, be strictly excluded. The surroundings should be quiet and peaceful. Everything should be done to secure ample rest and sleep, and any games or plays with older children, any tickling or romping with grown up people, any showing off in company which excites the child to such an extent as to be followed by tears, or by disturbed and restless sleep, should be curtailed or forbidden. Such care is of course especially necessary in the case of children who are naturally "nervous," or who have any hereditary tendency to nervous disorders. These children are sometimes difficult to manage when young, and often benefit by a change from the home surroundings. When they go to school the effect of lessons should be watched. The occurrence of restlessness at nights, walking in the sleep, irritability of temper, or loss of appetite will often indicate that lessons should be stopped for a time.

The same watchful care is necessary for any child who is growing rapidly. Many children grow "by fits and starts," and at such times a great strain is thrown on the circulation, and if the brain is being taxed at the same time irritability, inattention, apathy, and, later, sleeplessness give evidence of mental fatigue, and ought to warn the guardians of the need of more sleep and less mental application. The child should not be allowed to work at lessons up till bedtime, but should have at least an hour of recreation after lessons are over before going to bed.

Sense Organs.—The eyes are the most important of the organs of sense and the most liable to injury. The principal cause of injury is not over-use, for the eyes are being used as long as the child is awake, but improper use. The eyes of the child differ from those of the adult chiefly in that the power of accommodation is very much more perfect, so that a child can easily examine small objects placed much nearer the eye than would be comfortable for a grown person. If our sight is normal we usually hold the book we are reading at a distance of ten inches or more from our eyes. Although we can read a printed page held closer to the eye we are

conscious of some strain of our accommodation in doing so. But in the young child accommodation takes place so easily that such strain is not felt to be uncomfortable. Now the effect of this strain is to alter slightly the shape of the eyeball, and the shape assumed is that of the short-sighted eye. If this occurs only occasionally no harm is done, but if the child is allowed day after day to strain his accommodation over fine work—or indeed over *any* work held too near the eye—the growing eyeball will tend to assume the form which is so frequently impressed upon it. It is not too much to say that shortsightedness is almost always an acquired character, though of course some children acquire the condition with very little provocation. It may then be laid down as a rule that young children should not be allowed to do much fine work, especially fine bead work; nor to read much small type; and, again, whatever work they are engaged in should be kept as far away as convenient, and should be done in a good light. These rules are of course doubly important if there is any family tendency to near-sightedness.

The Ears.—Even slight deafness interferes seriously with the mental acquisitions of the child. Many cases of deafness are due to an extension to the ears of some inflammatory affection of the throat, or to the presence in the pharynx of adenoid growths. All cases of sore throat, therefore, should be placed promptly under medical treatment, and the pharnyx ought to be examined for adenoids in all children who are always catching cold, who snore much at night, or who habitually breathe through the mouth.

One other point with regard to the ears deserves mention. It has been found in a number of cases where children appeared somewhat stupid and uninterested in their work, that they were really slightly deaf, and that this deafness in some instances was due to no defect in the hearing apparatus but to want of cultivation of the hearing power, a fault quite amenable to treatment by practice in the habit of directing the attention to the recognition of sounds.

CHAPTER VI

The Senses

At the time of birth the child is "mind blind." That is to say, he is unable to interpret the various impressions which reach the brain through the organs of sense. This power appears slowly and by degrees, because the higher parts of the brain where the interpretation of sense impressions takes place are undeveloped, and their full evolution can only take place under the influence of the stimuli which reach them from without. The extent to which the different senses are active at the time of birth can be judged only by the effects of stimulation, and the only effects which we are able to gauge are movements. The interpretation of these movements, however, is difficult, because many of them may be called forth even though the exciting stimulus never reaches consciousness. When a bright light shines into the eye of a newly-born baby the pupil at once contracts. This proves that the retina is sensitive, that impressions can pass along the optic nerve to the brain, and there excite a response, which can be transmitted to the muscles of the iris. This is a purely reflex effect, and is not sufficient to prove that the stimulus is felt by the child. If, however, a greater effect is produced than can be accounted for as a simple reflex, for example, if the child throws its head about and begins to cry, then we may conclude that the stimulus has not been exhausted in the passage round the reflex arc from the retina to the pupil, but that a message has likewise been conveyed towards the higher cortical areas of the brain which will become the centres for vision. Even in the absence of this larger effect, however, it is probable that whenever an appropriate stimulus is applied to any of the sense organs, and is followed by an appropriate reflex movement, this movement does not represent the entire result of the passage of the stimulus through the short reflex circuit. Probably some impression is also

carried towards the developing cortex, although it is only when this impression exceeds a minimum intensity that its existence is made obvious by the occurrence of such widespread movements as are indicative of pleasure or discomfort. When such a result does take place, it must not be regarded as proof that the child is able to interpret the seat or nature of the stimulus.

Taste.—The sense of taste is particularly interesting from this point of view. It is usually said to be the first to be learned. There appears, however, to be a considerable amount of variation among young babies in their reactions to different tastes. Preyer says "the taste of sweet is plainly preferred at the very beginning. The little countenance, after the wetting of the tongue with glycerine or with a concentrated solution of sugar, wears almost invariably an expression of satisfaction. But let the tongue be touched with a solution of quinine, warm and not too much diluted, or with common salt, or let it be smeared with a crystal of tartaric acid, and movements of repulsion readily appear, accompanied with choking, with screaming, and with an expression of extreme displeasure on the face."

Here we evidently have something more than simple reflex movements, but are we entitled to say that the child at this early age is able to discriminate consciously between nice to eat and nasty? This would obviously be going too far, although some psychologists make use of language which implies such a belief. The discriminative movements should rather be looked upon as instinctive in character, and not necessarily indicative either of liking or disliking. This view is supported by the fact that older babies will sometimes make grimaces on experiencing a novel taste, and afterwards show signs of desire for more. A baby of eight months, on experiencing for the first time the taste of milk and scalded bread shuddered after each spoonful, although he took the food without resistance (Mrs Beatty, quoted by Miss Shinn).

Taste is said, by Sigismund, to be the first of all the senses

to yield clear perceptions which are stored up in memory. This certainly is what one would expect, for the chief states of pleasure in the life of a young baby recur many times daily in association with feeding.

Smell.—The sense of smell is closely associated with the sense of taste, and appears to be present to some extent soon after birth. It is not distinctly separate from taste even in the adult. According to Flechsig the centre for smell is the first of the centres of the special senses in the cortex to mature.

Touch.—Touch has been called the universal sense. It is present in a vague form even before birth. After birth the sense of contact with soft warm surroundings evidently awakens a pleasurable feeling before the power of discrimination is developed. The development of the sense of touch proceeds very rapidly and not only aids the child in his investigation of the outside world, but enables him to distinguish *himself*, that is to say his body, from all other objects.

The sense of touch is from a very early period particularly keen in the lips and the tip of the tongue, and the tendency of young babies to mouth and lick objects which are close to them is a form of experimentation with this sense. As the hand becomes more and more the specialised organ of touch the tendency to put things to the mouth except for the purpose of tasting them declines.

The sense of temperature, due to the difference between the temperature of the body and of the surrounding atmosphere, is also conveyed by the skin. Children, like all young animals, are very susceptible to changes in temperature, partly owing to their defective powers of heat formation, and partly to the comparatively large surface of the skin.

The muscle sense, by which we mean the sensations which arise from movements of the muscles, is very vague during the early weeks of life. It includes both sensations of movement and sensations of resistance and is closely associated with the sense of touch, as is seen for example in our manner

of investigating the roughness or smoothness, the softness or hardness of different bodies. By the time the child is three or four months old the muscle sense and the sense of touch become very closely associated with the visual sensations, and indeed greatly assist the development of visual perception through the strong propensity which now appears for touching, handling, and looking at everything within reach.

Sight.—At the time of birth the pupils react to light, and if the light is very bright the eyelids may be closed, and the child may appear to experience discomfort. Diffused daylight has been thought to give pleasure even during the first few days of life.

The movements of the eyes at first are apt to be irregular, the eyes being moved independently of one another, so that the baby often appears to be squinting. This irregularity gradually becomes less marked, but may be noticed occasionally up to the third month. The eyelids similarly may move irregularly. During the first few days they are usually kept only half open even when the child is awake.

For some time after birth the child cannot distinguish objects. "He does not enter the world, as we do the theatre, upon a scene all arranged in advance which the spectator sees as a whole at one glance" (Compayré). On the contrary his field of vision is composed simply of dark and light blurred patches with no distinct outlines. At first the child simply stares into space. It is not easy to tell whether he is really looking at anything until the accomplishment of following a slowly moving object with the eyes has been acquired. Darwin thought his child definitely looked at a lighted candle on the ninth day, and Preyer's baby followed with his eyes a light moved slowly from side to side on the twenty-third day. After this the child begins to look with attention at surrounding objects, and to find pleasure in following with his eyes the faces of people moving about.

After sensations of light, sensations of colour begin to be noticed. Many observations have been made on the recog-

nition of colour by young children, but the results vary considerably and hence it is not easy to generalise them. Pleasure in various colours is manifested very early. Novelty is frequently the most important factor in determining choice among colours exhibited experimentally. The principal colours are distinguished before the child can talk, but for a long time after this there is often a confusion between the names of different colours. This may render the results of experiments with colours doubtful, as the child may recognise a colour but name it wrongly. Even with methods of observation which do not involve the naming of colours, confusion may arise from the child's misunderstanding what is required of him, as when he is asked to match colours which have been shown to him. Yellow was found by Preyer, and red by Binet, to be most easily recognised by children they studied in the third year.

It is only by slow degrees that a child learns to recognise what an object is. The perception of solid form and the recognition of the distance of objects is closely associated with the combined use of the senses of sight and touch. Moving objects, and especially people, attract attention early, and may be recognised at the age of a few weeks. In the ninth week baby Hall recognised his mother as she was entering the room by a door five feet distant; but moving objects in the street, fifty feet from the window, were apparently unnoticed till the fifteenth week.

Some experience of distance is gained by grasping at objects, and by the age of six months some children seem to know when an object is within reach, and will not put out their hand to take it if it is held out of reach. Older children often persistently grasp at objects much beyond their reach, but this does not necessarily mean that they imagine the coveted body to be near enough to be taken hold of. It is often obviously simply an expression of desire for what they can ask for in no other way. However, the sense of distance remains extremely vague until the child is able to make his way about by himself, and several years elapse

before he can form any clear notions of the distance of things really far off.

The power to recognise solidity by the eye is likewise gained by experience. At first the baby is apt to confuse the plane and solid form, and to attempt to pick up figures from the carpet or shadows moving on the wall. The discrimination of solid form in the case of near objects develops rapidly, but it is a long time before the child learns the substantial character of distant objects. The reason for this is not only that these are less familiar, but because they do not, like near objects, rapidly change their apparent form with the child's movements, and also because they produce practically identical images upon the two retinæ.

Hearing.—At the time of birth air has not penetrated to the drum of the ear, and until this takes place the child is deaf, although he may be disturbed by loud jarring sounds, such as the slamming of a door. According to Krohn, a child may give unmistakable evidence of hearing within two hours of birth, but, as a general rule, reaction even to loud sounds is not noticed till the second or third day, and some weeks elapse before the hearing is at all acute. This temporary deafness is doubtless an advantage to the child as it enables him to sleep peacefully without being disturbed by the noises about him. Some degree of localisation of sounds has been noted as occurring by the fourteenth day, but it is difficult to be sure of this. Even in the adult localisation of sound is very difficult. Preyer's child turned towards sounds heard in the twelfth week, Darwin's about the seventeenth, and Winfield Hall's in the twenty-first.

The sense of hearing becomes a source both of pleasure and interest very early. New sounds, and especially musical sounds, at once attract attention, and their power of making a child stop fretting is daily taken advantage of in the nursery. Very strange or very loud sounds, however, are peculiarly liable to provoke fear. Children, like adults, vary very greatly in the pleasure they take in hearing music. Rhythmical sounds please them, but they especially delight

in sounds made by themselves, either in experimenting with their own vocal organs or in making a racket with anything that will serve the purpose. Children often delight in loud chanting or singing without being able to follow a tune, and will often sacrifice even rhythm to sense. For example, a child hearing his mother singing, "Guide me, O Thou great Jehovah," began singing, "Guide mamma, O Thou great Jehovah." (Quoted by Miss Shinn.)

All knowledge is derived through the exercise of the senses, a fact which Bunyan has picturesquely expressed by speaking of the various senses as the Gates of the City of Mansoul. At the time of birth the higher parts of the brain are in such a rudimentary condition that the actions of the infant very closely resemble those of which an animal whose cerebral hemispheres have been removed is still capable. That is to say, they are chiefly reflex in character, and the child is unable to interpret his sensations. Nevertheless the possibilities of future organisation are already determined. According to recent observations it appears to be a fact that every cell which will ever enter into the composition of the brain is already present, but must await the arrival of appropriate stimuli before it can undergo further growth and organisation. The limits of such growth and organisation are predetermined by heredity. Unless the proper nerve cells are present, and are moreover possessed of the requisite potentialities, no effort at education in any determinate direction, no repetition or concentration of the suitable stimuli, will attain success. But however strongly we may insist upon the innumerable variations in the congenital structure of the brain, nothing could be further from the truth than the idea that the life of the child is predetermined from its birth without reference to its surroundings, and the influence of early training. Even in the commonest of mortals the possibilities of mental and moral growth are very numerous, and the function of education is to select among these in order that the energy of growth may flow into the highest combinations.

The possibility of individual adaptation to environment, or in other words, the possibility of congenital tendencies being modified by training, is not however wholly dependent upon a sort of selection among the developing cells of the brain, but rather upon the particular lines of association which are laid down by exercise, and the particular combinations of cells which thereby come to act together habitually. According to Flechsig, who has recently studied the course of the development of the brain in children, only one-third of the cortex is directly connected either with the incoming impressions from the organs of sense or with the mechanism of movement. The fibres which pass from the cells in the remaining two thirds of the cortex do not pass either directly or indirectly to the periphery. They find their destination in the cortical centres for the special senses, and therefore Flechsig has suggested that these areas of the cortex are concerned in the function of association and of the higher mental processes. These association centres and the fibres connected with them grow very slowly in early childhood, their period of most rapid growth being apparently in adolescence, after the sense centres have practically reached maturity. The acuteness of every one of our senses is definitely dependent on the structure of the appropriate sense organ. The improvement which takes place with practice is chiefly mental. The man who can see best is the man who understands most, and who therefore best knows what to look for. The possibilities of improvement in any of our senses are so great that it is probably not too much to say that it would be physically impossible for any man to bring all his senses to the perfection of which they are capable. A blind child, for example, is not naturally endowed with any greater refinement of his other senses whereby his deficiency may in some degree be made up, yet under suitable, and often only under very prolonged and very patient training, the senses of touch and hearing become so acute as to awaken our astonishment. But if the blind lose his seeing finger, no other can take its place until it also has undergone training. An interest-

ing illustration of the bearing of the training of the senses upon mental development, and of the influence of the character of the stream of sense impressions upon the pattern of the association meshwork, is furnished by a consideration of the intellectual abilities of the blind. We have seen that the higher cortical centres in the brain develop under the influence of stimuli from without. Now it has been calculated that of all the stimuli from the outside world which reach the brain, nine-tenths come from the organs of sight, so that the blind are dependent on the remaining one-tenth for the scenery of their mental world. Yet no one can imagine that these figures represent in any way the intellectual difference between the seeing and the blind, whose social and educational advantages have been as similar as possible. Partly by the careful training of his other senses, partly by the habit of calling up the memories of past sense impressions, partly by the cultivation of the habit of reflection, the intellectual deficiency of the educated blind is much less than one might expect. And this really means that some of the possibilities inherent in his brain structure are called into activity which, but for the accident which deprived him of his sight, might have lain dormant all his life.

Training of the Senses.—Childhood is acknowledged to be the period for the education of the senses. The education of the senses involves in the first place the control of the organs of sense. The eyes must be properly directed and focussed, for instance, before a clear image can be obtained. But in the main the training of the senses is a mental training. It is through his senses that the child gathers material for the mind to act upon. The spirit of investigation appears early, and all day long during his waking hours the child finds the keenest pleasure in touching, hammering, handling everything he can lay his hands upon, to find out what there is in it of noise, and colour, and strength, and form. If the child is to make good use of these early gathering years he must have abundant opportunity for the exercise of his senses, and a little guidance in using

them aright. Opportunity means absolute freedom to touch and play with numbers of common things, things which, in this first learning of the child, are valuable above all others just because they are common and at hand, and can be known so as to lead to a knowledge of all things else in the universe. Guidance the child also needs, because he has a great tendency to rest satisfied with the identification of objects by some salient feature, and to be blind to differences which are not forced upon his attention. The discrimination of the differences between objects is very important in order that the child may learn to observe accurately, and define his sense-impressions clearly. Although children are usually credited with being good observers, it is astonishing how frequently they go about the world without ever noticing the most conspicuous objects in their neighbourhood, if their attention has never been directed to them; and associated with this is their ignorance of the properties of the most common objects. Dr Hall bases upon systematic studies, which have been made on this subject, the statement that "there is next to nothing of educational value the knowledge of which it is safe to assume at the beginning of school life. Hence the need of objects and the danger of books, word cramming, and rote learning." The best preparation which children can get for their future education is to become acquainted with common natural objects. If the child lives in the country there is abundant material always at hand, and even in the town there is no lack. It is satisfactory to notice that the Board of Education has recognised the value and necessity of teaching of this kind in a circular just issued to teachers in rural elementary schools. One paragraph expresses very clearly the proper aim of such training.

"One of the main objects of the teacher should be to develop in every boy and girl that habit of inquiry and research so natural to children; they should be encouraged to ask their own questions about the simple phenomena of Nature which they see around them, and themselves to search for flowers, plants, insects, and other objects to illustrate the

lessons which they have learnt with their teacher. The teacher should, as occasion offers, take the children out of doors for school walks at the various seasons of the year, and give simple lessons on the spot about animals in the fields and farmyards, about ploughing and sowing, about fruit trees and forest trees, about birds, insects and flowers, and other objects of interest."

A more systematic study of form and colour and other varieties of sense impression may be introduced by degrees. This should be done in such a way as to interest the child and to secure his attention without producing fatigue. He should be encouraged to make practical use of each new acquirement, for instance, by noticing how the things about him are built up out of combinations of the elementary forms he has learnt, or by drawing or modelling, or kindergarten occupations.

The training of the hand is closely associated with the training of the eye. In the young child the hand is the companion and interpreter of the eye rather than its servant. A child who may look but who mustn't touch will often look without seeing. If the eye say to the hand, "Thou art not of the body," the eye itself will be the first to suffer. In blind children great discriminative tactile sensibility is developed by such exercises as sorting beads according to sizes, and then by stringing these upon wires of suitable thickness. Occupations of this nature would be unsuitable for normal children, because they would naturally try to aid touch by sight, and eye strain would readily be brought about. The same criticism applies to some of the kindergarten occupations, which are admirable in other respects. Drawing, and modelling in clay or plasticine, afford admirable means for the training of hand and eye, and of the observing powers. Drawing, as a means of expression, should precede writing. Its value is referred to more fully in a later chapter.

The ear and the organs of speech are as closely associated in their education as are the eye and the hand. In learning

to talk the child obtains abundant exercise of the organs of hearing in the discrimination of the different sounds which he requires to reproduce. Sounds which the child confuses, such as those of similar letters in words, should be repeated as plainly as possible in order that he may obtain the distinct impressions which must precede correct pronunciation. Systematic exercise of the ear by music and singing forms an important part of early sense training. Individual differences are of course very great. Preyer mentions a baby who could sing correctly every note given her from the piano in her ninth month. Doubtless such an instance is very exceptional, but, at any rate, all children should have the advantage of training for such musical capacity as they possess.

Taste, smell, and touch in the passive form, are spoken of by psychologists as the lower senses, because they are of comparatively slight importance in aiding mental growth, as compared with the higher senses of sight, hearing, and touch proper. The lower senses are connected especially with sensations which relate to the nutrition of the body, such as hunger, thirst, warmth, coldness. Their training should include the recognition of the wholesomeness of food, the closeness or otherwise of the air in a room.

CHAPTER VII

The Muscles

One of the standing puzzles of the world to a healthy child is why it should be that grown people often seem to like to sit still when they might run about if they liked. "My legs feel like running," says the boy. And so he runs, and jumps, and shouts, and fidgets because the members of his body cry aloud for exercise. His mind also, in his waking hours, is never at rest. His mental activity constantly seeks expression in action. His curiosity, his desire to touch and

handle, his eagerness to experiment with whatever is within his reach, are all indications of a desire to find expression, to "make the inner become the outer." Some of the most important reforms which are taking place in educational methods are based on the theory that all true education should seek not to suppress but to guide this self-activity of the child, which must be trained into right and ennobling habits, and made to minister to the development of the mind.

Classification of the Child's Movements.—The various movements of the child have been classified in various ways. We shall follow here the arrangement of Professor Preyer, who has given us a very full account of the subject. He classifies the child's movements as impulsive, reflex, instinctive, and ideational. I prefer to substitute the term random, which I take from Sully, for impulsive, as the latter term has acquired a different significance in English psychological literature.

1. ***Random Movements.***—In young infants we meet with a kind of movement which is neither voluntary nor obviously dependent upon any sensory stimulus. These movements are spoken of as impulsive, random, or spontaneous. They are commonly explained as arising from changes in the composition of the blood flowing through the capillaries of the brain, but I should be more inclined to attribute them to the liberation of energy from nerve cells which, owing to the activity of the growth-processes going on within them, are in a state of unstable equilibrium and ready to be fired off, as it were, on the slightest stimulus from the body, or to overflow from the mere accumulation of energy within themselves. Examples of movements of this class are found in the stretching of the limbs of young babies, in the sudden twitches and starts when undisturbed, in their grimaces when asleep, and in the movements of the eyeballs when the eyelids are closed. Movements of this kind are most marked in very young children. In older children they are not easily distinguished from other classes of movement, but may be

seen during sleep. Possibly their function is to be found in the exercise they afford for the motor paths from the brain to the muscles, for the muscles themselves, and for the paths of muscular sensation.

2. ***Reflex Movements.***—So many of the most important functions of the body are carried out by reflex action that we are not surprised to find that many of the reflexes are already established at the time of birth. Swallowing, sneezing, hiccoughing, the contraction of the pupils in a bright light may serve as examples. The first cry of the child on entering the world is regarded by Preyer as of reflex origin, a view much more reasonable than that of Kant who speaks of it as a cry of indignation and wrath, or than the common view that it is due to pain. As Darwin and Preyer point out it is not uncommon for respiration to begin with a sneeze instead of with a cry. Doubtless the imperfect aeration of the blood at the time of birth plays an important part in establishing the process of respiration by rendering the respiratory centres more excitable. The inhibition of reflex movement is very important, as through it the will develops on the negative side. This is seen in the control of the bladder and bowel which children acquire to some extent during the second half year.

3. ***Instinctive Movements.***—Under this heading Preyer includes a somewhat varied series of activities some of which are hardly distinguishable from reflex movements, while others, if instinctive in origin, are only brought to perfection with the co-operation of intelligence.

Sucking is an example of a complex movement which is present at the time of birth and can be readily excited by placing a finger in the mouth upon the tongue. The principal reason for regarding sucking as something more than a simple reflex is that the stimulus required to produce it varies considerably at different times. This however might be due simply to the excitability of the nerve centre being increased by hunger. The movement seems to fit Dr Spencer's definition of instinct as compound reflex action.

Seizing.—At the time of birth the baby hands close with remarkable force upon anything placed within their grasp, so that, as Dr Louis Robinson has recently shewn, the baby may actually be suspended hanging from one's finger by the power of its own grasp. Dr Robinson suggests that we find here a survival of the instinctive clinging of the babe to its mother amongst our arboreal ancestors. True seizing of an object with desire, guided by sight and not merely by contact, is not noticed for many weeks, usually in the fourth month (sixteenth to eighteenth week in several cases observed).

Raising the Head. — During the first few weeks of life impulsive movements of the head may be noticed, but when the child is lifted up or turned about the head bobs loosely from side to side. Towards the end of the second month the head may occasionally be held for a few seconds in equilibrium, and in the succeeding weeks the power of doing so increases rapidly, and we now note one of the earliest manifestations of will in the raising of the head to get a better view.

Sitting. — By the fifth or sixth month, occasionally earlier and often not till later, children are able to pull themselves up into a sitting posture, or even to sit unsupported for a few moments. The power of sitting rapidly increases, but the child should not be allowed to sit long without support. Children of seven or eight months when out riding will often pull themselves up into a sitting posture in order to see passing objects better. When they do this they should be made comfortable with pillows and allowed to look about, but should again be laid in the horizontal position as soon as they shew signs of getting tired. By the ninth or tenth month many children delight to sit independently.

Locomotion.—The earliest attempts at locomotion vary considerably in character. Creeping proverbially precedes walking, but many children never creep. Some roll from one place to another, others hitch themselves along in a sitting posture. Some children find a difficulty in controlling the

direction of locomotion. Both Miss Shinn and Mrs Hall note that on several occasions the effort to creep resulted in a backward movement so that, to the baby's disgust, the desired object only got further and further away in its attempts to reach it. The first efforts at standing may occur very early (twenty-third week for Baby Hall), when the baby takes a delight in "feeling its feet," as the nurses say. The power of standing alone is seldom noticed before the eighth month, and then only for a minute or two. The first attempts to walk usually occur between the ninth and the eighteenth months. The time depends partly on the strength of the child, and partly on the attempts which have been made to teach him to walk. Children who have young companions to play with usually begin to walk early. At first the baby supports himself by the wall or by articles of furniture; then, often quite suddenly, excited perhaps by some older child or by the sight of some plaything, he starts off by himself and walks or trots unsteadily but successfully to the desired goal.

When children desire to creep they should be allowed to do so freely. Walking will come in good time. There can be no harm in giving a child lessons in walking by supporting him under the arms or letting him hold a finger in each hand for support while he attempts to make his way forward, but go-carts should be prohibited because they allow the weight of the child to be borne for too long a time by the legs, and also because the pressure on the child's chest hinders proper development and may produce deformity.

4. ***Ideational Movements.***—Under this heading are included imitative, expressive, and deliberative movements. As they are dependent even in their simplest forms upon sense perception they are necessarily somewhat late in appearing.

Imitative movements almost always begin during the second half of the first year. Those which have been noticed earlier, such as the crying of a young baby when it hears another infant crying, are of somewhat doubtful nature. During the second year, and especially after the eighteenth month,

imitative movements become very numerous and occur quite unsolicited. They are much more complex in character than those observed in the first year, the child noticing all the actions of those about him and striving to repeat them, however little he understands their meaning. He finds great pleasure in putting on his father's hat, in shaving with a piece of stick, in feeding and dressing and washing his toys. He imitates closely the expressions and gestures of those about him, and thereby lays the foundations of good or bad habits which may continue to grow with his growth. It becomes therefore of the greatest importance that those who have charge of the child should be of refined habits of speech and manners. In these imitative actions of the baby we find the foundation of the make-believe plays (school, shop, etc.) which give such delight to older children.

The expressive movements are at first indicative simply of pleasure or pain. The smiling, laughing, and crowing accompanied by movements of the limbs are early indications of pleasure, while drawing down the corners of the mouth and wrinkling the forehead indicate the onset of tears. Shaking the head in negation or refusal, nodding in affirmation, pointing, pouting, kissing, shrugging the shoulders, are other examples of expressive movements. The movements indicative of the simpler emotions such as wonder, anger, fear, are all frequently manifested before the imitative habits of the child are well developed. Just for this very reason the emotional character of those about the child is of the greatest importance, for when the child imitates, as it will, the displays of emotion by others, the emotions themselves are imaginatively reproduced, and unquestionably impress themselves upon the child's character.

The deliberative movements illustrate the gradually advancing control of the will over movements which have already been performed reflexly or instinctively or as random movements. The order in which control comes to be exercised over the various movements has attracted a good deal of attention in recent years, and the results are held by some authorities to

indicate the advisability of altering some of the current methods of teaching young children, especially the teaching of writing and drawing, and some of the kindergarten employments. The principal observations which have been made appear to indicate that the large movements, on the whole, precede the finer movements, and that movements involving the simpler forms of co-ordination precede those which are more complex. The simplest movements we can perform usually require the co-operation of several muscles belonging to a single group, but more complex movements may require the co-operation of two, three, four, or more groups of muscles. It has been objected to this statement of the evolution of movements that a young baby can grasp firmly before it can direct the movements of its arm so as to carry a spoon successfully to its mouth, and this fact is said to be opposed to the idea that movements tend to develop "from the centre outwards." No fault can be found with this observation, but the inference is not justifiable. The early clasping of a baby's hand on whatever is placed within it is merely reflex or instinctive, and even when the action is performed deliberately it is a movement of a very simple kind. On the other hand, when the baby grasps a spoon and carries it against its cheek instead of to its mouth the fault does not lie simply in a misdirection of the large movements of the arm and forearm, but in a failure to carry out accurately a very complex co-ordination involving not only the movements of all the joints of the upper limb, but also of the eyes through which a visual judgment must be formed of the allowance to be made for the length of the spoon.

The different plays in which children indulge from babyhood onwards illustrate very well the gradually increasing control over the muscles, for every new acquirement is a joy to the child who delights to repeat it again and again. In a baby the simplest movements are illustrated in the joy of shaking a rattle or hammering on a tray. Even such movements are at first performed very imperfectly, being interrupted by impulsive movements, and liable to be stopped

by anything that attracts the baby's attention for a moment, so that the plaything is dropped on the floor. This soon becomes a new source of pleasure, and the baby shows the greatest delight in throwing everything that is given to him on the floor, and repeating the operation as often as possible.

The Training of the Muscles.—The great propensity of children for "doing" renders any special training of the muscles unnecessary, at least in early years and in healthy children. Only give the child proper outlets for his activity and the development of muscular ability and power will take care of itself. All the favourite nursery games and toys have their value in exercising not only the muscles but the minds of the children in different ways, so that in their play they pick up ideas of form and colour, of size, of number, of weight, and so on.

Play.—This seems the most appropriate place to consider the meaning and the value of play, although the treatment of the subject must involve at least the mention of other questions besides the development of muscle.

The Reason for Play.—The favourite theory of play, up till recent years, has been that which we owe to the poet Schiller. According to this theory play is an overflow of high animal spirits, an outlet for excessive energy, a surplus of life. To this theory Herbert Spencer added the idea of imitation as explaining the forms which play is wont to take. To these theories the principal objection is that they are too simple. They do not cover all the facts. We shall come to a better understanding of the meaning of play if we consider it from the point of view of evolution. We have already seen reason to believe that the principal characteristic of the infant, and to a very much smaller degree of the young of some of the higher animals, is its educability, and that the appearance of this character has been rendered possible chiefly by the period of babyhood which allows the young to be fed, and cared for, and shielded from danger while they are acquiring powers which would otherwise have been inherited as

instincts. These powers being individually acquired are less stereotyped than instincts. The waning of instinct has meant the waxing of intelligence. Play is the means whereby individual powers are acquired; it is the apprenticeship for the work of life; it has permitted the development of individuality; it has given scope for variation and for individual adaptation to different environments; it has favoured the growth of intelligence and thereby permitted man not only to choose, but to some extent to make, his environment and thereby assist in his own evolution. A little child at play is "at his lessons." The lesson book is the world. The task is just to learn "all about everything."

The Forms of Play.—I have said that in the history of the race instinct has gradually been replaced by intelligence. As it has been in the race so is it in every child. Nature never forgets her past, and so we find all the primitive forms of instinct reappearing in the child's play, and gradually by their exercise giving place to the intellectual powers. The play period may be roughly divided into three terms which are not sharply divided from one another but which are very characteristic. The first period is that in which the child is gaining mastery over his bodily powers, and is characterised chiefly by the restless spirit of childhood. It includes the first six or seven years. The second period, extending from the seventh to the twelfth year, sees the strengthening of the intellectual powers. Its spirit is that of emulation, and this spirit dominates the favourite games of boyhood. In the third period the social spirit develops, and the characteristic games are those in which the boy plays not for himself but for his team.

Keeping these points in mind let us consider play as an instinct. Space will only permit of the very briefest summary of the facts. The chief instincts or impulses appearing in play are:—

(1) The instinct of movement: kicking, gesticulating, grimacing; cooing, crowing, laughing, babbling, talking, singing; running, jumping, climbing.

(2) The instinct of action: skipping, hoops, tops; kites; ride-a-cock-horse; dancing in its simpler forms.

(3) The instinct of construction: sand, mud-pies, blocks, scribbling, drawing, modelling; scissors and paper, pen-knives, carpenter's tools, carving.

Note how many of these childish enjoyments lead on to the hobbies and occupations of adult life. Think of the climbing instinct in the baby, in the schoolboy, in the young man; the favourite dances at different ages; the pleasure in making something, whether it be a mud-pie, or a toy boat, or a carved picture-frame, or a rood-screen, or a cathedral.

(4) The instinct of investigation: dropping things, rattling, hammering, teasing, destroying. The instinct to experiment is one of the most interesting, and if rightly guided, one of the most valuable of the child's impulses. We find it displayed in the counting out games; in foretelling the future by counting plum stones or daisy petals; in telling the time by the number of puffs required to blow the down off a "clock." We find it also in the make-believe games where the child pretends to be a dog in order to find out what it feels like to be a dog. By experiment the child learns to what extent he may discount his nurse's threats, and discovers exactly how far it is safe to disobey his nurse, his mother, and his father. The destructive impulses, so manifest in many children, may be perversions of the instinct to construct, or may be manifestations of the instinct under consideration. However troublesome this destructiveness may be there is, generally speaking, nothing "wicked" about it. It indicates in part the lack of proper channels for activity, and in part the ignorance of the child who must do something, and therefore does whatever comes to hand.

(5) The instinct of imitation: imitating sounds (barking, mewing, etc.), gestures, actions; pretending to be a horse, a tiger, an engine; dressing up, acting; make-believe plays—circus, shop, school.

(6) The instinct of power: games of skill—tops, marbles, battledore and shuttlecock, ball games, Aunt Sally, quoits,

deck quoits; many card games; draughts, chess; the hunting instinct—chasing balls, butterflies, cats, carriages; hide-and-seek, hunt the slipper, tig, king, Jack's in his castle, hounds and hares, paper chases, steeple chases, racing, jumping, vaulting.

In this group we find most of the favourite games of young schoolboys, games which owe much of their attraction to the spirit of emulation which they foster, whereby each boy is stimulated to do his best, to develop to the highest possible point his strength, and his swiftness, his accuracy of hand and eye, his skill in doing difficult things. This aspect of boys' games is worthy of study by teachers who desire to banish the spirit of emulation entirely from the class-room.

(7) The social instinct. Amongst the earliest manifestations of this instinct are the little girls' doll-plays and the love of doll's houses and playthings of the domestic type: teasets, weights and scales, toy shops. These perhaps should rather be considered early indications of the maternal instinct, but little boys often enjoy playing with dolls, at any rate in the absence of their sisters. The social instinct in its wider form is pretty late in appearing, and the games in which it takes form are by far the most important type of the play activity. The chief of these games are cricket, football, lacrosse, hockey, base-ball. These games not only demand the expenditure of energy, strength, and swiftness, and soundness of wind. In each there is something difficult to be done, something which is worth doing only because it is difficult. In order that this may be done, pluck and perseverance and skill are required. Yet these are not enough. The race is not to the swift nor the victory to the strong. That the game may be won each boy must know the necessity of obedience to law, he must control his temper, he must subordinate individual self-assertion to the good of the whole. Always he must play for his side, never for himself. All these games also foster the boy's spirit of loyalty to his fellows, to his team, to his school. When properly organised they do more than aught else to establish a wholesome *esprit de corps* in a school.

Bicycling for Children.—The bicycle must be admitted to be one of the greatest boons which we owe to an age of mechanism, and especially to the town dweller who is enabled to get fresh air, exercise, and change of scene with a facility hitherto impossible. As an exercise for children, bicycling has both advantages and limitations. Amongst the latter may be placed its tendency to interfere with games.

No child should be allowed to cycle under the age of seven years, and in a hilly district, or one where the roads are rough, even that is probably too young. The cycle should be very light, and the bearings should run very smoothly. The gear should be very low, and should be suited to the development of the child, the build of the machine, and the nature of the roads. The machine should be carefully adjusted to the child.

The saddle should be sufficiently broad, and it should have either no peak or a peak so soft as to obviate any risk of injurious pressure even during the jolting on a rough road. The seat should be well over the pedals so as to take advantage of the weight of the body in riding, and its height should be so adjusted that the heel can just rest easily on the pedal at its lowest point. The handle bars should be sufficiently high and should curve sufficiently far back to allow the child to sit upright with ease. One bicycle should not be common property among a number of children who differ considerably in size.

Clothing should be adapted to the nature of the exercise, but it is probably unnecessary to enter into details on this subject now that cycling has become universal.

The principal dangers of cycling (apart from accidents), arise from riding too steep hills, riding against a strong wind especially when tired, riding too far, and riding too fast. All these are especially to be guarded against in the case of children who are not in good form for severe exercise. It may not be out of place to say that after an illness cycling should be indulged in with very great caution, and the form attained before the illness reacquired by degrees.

The Dangers of Games.—Games have of course their

dangers but these may be minimised by the exercise of a little care and common sense. The risk of accident can be greatly lessened by just sufficient supervision to ensure that rules are strictly adhered to. In games which involve the trial of strength or endurance, children should only play with those who are approximately their own equals, size, weight, and proficiency in the game all being taken into account. This is especially important in games involving prolonged and severe exertion or sudden strain, and in games where the competitive element is a feature. The danger of strain is greatly increased if a boy is much out of training, for instance, after an illness. In long races, steeplechases, cycling, a boy is constantly tempted to overstrain himself, while in the tackling in football a sudden strain is endured which is thrown especially on the organs of circulation and may do serious damage to the heart if there be any weakness.

Hockey has recently become very popular in girls' schools, and frequently, as I am told, to the great advantage of all the work of the school. Hockey, however, is a decidedly fast game, and a girl who undertakes it should be sound of wind and limb. While it undoubtedly suits some girls admirably it should not be taken up too suddenly by a girl who is not in the habit of taking regular active exercise.[1]

CHAPTER VIII

The Emotions

NOWHERE is the closeness of the connection between mind and body more manifest than in the emotional states, whose outward display in the youngest children is identical with their bodily expression in the adult. Some of the emotions occur at such an early period that there is no possibility of their expression being in any way due to imitation. Their origin, their mode of expression, and their significance must be

[1] Some further remarks on play will be found in Chapter XII.

sought in the domain of instinct. They are forms of instinctive reaction to the objects that excite them. The characteristic features of the emotions of young children are their direct dependence on the presence of the exciting object; their entire dominance of the child's consciousness for the time being; their fugitiveness; and their independence (in the absence of experience) of intellectual or voluntary control.

Fear.—The time at which the first manifestations of fear are noticed varies very considerably. Very young infants may exhibit a sort of innate or organic fear, starting, trembling, and bursting into loud screams at any unusual sensation, especially if startled by a sudden loud noise, such as the whistle of an engine or the banging of a door. Fear was exhibited by Mrs Hall's baby in the fifth week on being laid down when naked, and again in the same week when first bathed by the mother who held him less firmly than the nurse had done. The same baby was frightened by a strange face in the sixteenth week, by being taken into a strange house in the twentieth week, and by hearing a fog-horn in the twenty-eighth.

In the early months of life sounds produce fear more readily than unusual sights. Darwin's baby was usually pleased at strange noises but, when four and a half months old, was frightened on hearing a loud snore. Fear of falling when being dandled may be exhibited in the fifth or sixth month, and again when learning to walk, even by children who have never actually fallen.

Fear at unusual sights soon develops after the child has begun to take stock of his surroundings. Preyer notes fear of a dog, which however was barking, at nine months, of persons dressed in black, at seventeen months, and of the sea at twenty-one months.

Dr G. Stanley Hall has published an elaborate "Study of Fears,"[1] in which he comes to the conclusion that, in the fear experiences of childhood, we find reflections of long distant ages of life in the world. Amongst the principal

[1] *Amer. Jour. of Psychol.*, vol. viii., 1897.

fears he mentions fear of water, of wind, of darkness, of thunder and lightning, of animals, of fur, of big eyes, of teeth, dream-fears, fear of ghosts, horror of being alone. "We have two hundred and twenty-three cases," he says in another article,[1] "which shew that children during their first year of life have an instinctive fear of fur. It is not because they see it, but because they touch it. They sometimes have fits if they touch it. It is touched, and there is some apparatus there which causes convulsions in a child who touches the fur. Another common cause of fear is big eyes; making big eyes at children frightens them. Why should a child be afraid of big eyes, of an owl, for instance? Another terror to a young child is a great display of teeth. If the teeth are false, and show a slight motion, the fear is very manifest. How can we explain such things? . . . I am persuaded after a careful study of this, that here we have some of the oldest things in the human soul that take us away back, so that we call those fears rudimentary organs. . . . These fears are traces of a long struggle which we know the human race went through with animals with big teeth, big eyes, and fur, that were sometimes threatening to exterminate the human race."

Between the ages of three and seven sleep is frequently disturbed by fright. Bad dreams occurring during sleep disturbed from whatever cause often take their colouring from some slight fright actually experienced. They are not unimportant as they often make the child timorous through the day, even to a more marked extent than the real occurrence did. Preyer's child, when two and a quarter years of age, was shewn some little pigs to give him pleasure, but when he saw them begin to suck the teats of the mother he became greatly terrified thinking they were biting her. This sight apparently impressed the childish imagination very strongly, and Preyer notes that "the fear became so great in the course of the fourth and fifth year that the child sometimes cried out in the night and imagined that a pig was going to bite him."

[1] *Trans. Illinois Soc. for Child Study*, vol. ii., 1897.

Again a little girl of twenty-seven months was accidentally run over by a dog and much frightened. Next day she shewed signs of fear on seeing a dog in the street. Two nights after the occurrence she awoke from sleep with a violent outcry and was found in a paroxysm of fright from a bad dream. "Doggie run over baby ānā (there)" she repeated again and again. Next day she could not be induced to go into her bedroom, protesting, "Doggie in ānā," and for several days the sight of a dog in the street threw her into such a paroxysm of fear that she had to be brought home to be comforted (Baldwin).

The condition known as "night-terrors" is distinct from such night-mares as have been referred to, and is a more serious condition for which medical advice should be sought. The child usually wakes up through the night in extreme fright at some vision he has seen. He often seems completely bewildered and may not recognise where he is or those about him. Next morning there is often no recollection of what has happened.

Fear is in the first instance innate or inherited. Timid mothers have timid children, and such timidity is very apt to be increased sympathetically during babyhood. On the other hand, innate fears are likely to diminish or disappear with the gradual accumulation of experience, and the more readily if the child's attendants are unemotional.

Surprise and Astonishment.—States of pleasurable feeling are frequently manifested, even when the baby is only a few days old, by wide open eyes which give the child a surprised look. Hence it is very difficult to determine when surprise is really felt for the first time by the child, but there can be no doubt that it appears very early. Novelty of impression is the principal cause of the feeling, and we can hardly suppose that a child can feel surprised until he has begun to take some stock of his sensations. The infant who was surprised at his own fingers, and "stared at them with great attention" at the age of one week (Tracy) seems altogether too precocious, for the power of fixation does not

develop for some weeks. Preyer's baby looked surprised on the twenty-fifth day when his father nodded to him, and again when he spoke to him in a deep voice. Miss Shinn's niece also began to assume a look of interest on the twenty-fifth day as she stared at the faces of those about her, but it was not till towards the end of the third month that her gazing about the room was attended by a look of surprise.

It is only after the baby has gained some experience of his surroundings, often not till he is four or five months old, that he is liable to be overcome by astonishment, manifested by wide open eyes, fixed gaze, opening of the mouth, and cessation of movement. This speechlessness may be followed by signs of pleasure or of fear. Preyer's baby manifested astonishment in the twenty-second week, when his father suddenly entered after a brief separation "so that at the same moment he saw my face and heard my voice"; in the thirty-first week at the clapping together of a fan; in the thirty-fourth, at an imitation of the voices of animals; in the forty-fourth, at a strange face near; in the fifty-second, at a new sound; in the fifty-eighth, at a lantern.

Curiosity is closely allied to wonder on the one hand, and to fear on the other, a relationship which is manifested in the lower animals, even in fishes, by the tendency alternately to approach and dash away from a strange object. On its appearance in the young child it is at first almost entirely sensual, yet it is a welcome sign of the child's mental development. As Tracy says, "it consists of a sort of chronic hunger for new sensations, which impels the child constantly to handle, examine, taste, and otherwise experiment upon all objects that come within his reach."

Anger.—While fear may be regarded as the instinct of self-preservation in its passive form, anger may be considered as the active form of the same instinct. Like fear, anger appears early, often in the second month. Its outward manifestation includes flushing and swelling of the face, and an impulse to inflict injury on the cause of the emotion. This impulse furnishes a good example of a spreading movement.

Thus there may be noticed successively a contraction of the brows, a fixed gaze, dilatation of the nostrils, clenching of the jaws, stiffening of the arms, closing of the fists, and an impulse to run forward and attack or injure. Even in young babies the impulse to beat an offending nurse or toy is very strong. In older children the feeling of anger may pass from a painful into a partly pleasurable state following the injury of the object of offence. Indeed, this pleasurable phase of anger may occur at a very early period where the transition may be very abrupt. Has the desire to obtain this pleasure anything to do with the habit not uncommon in babies of suddenly scratching any face within their reach?

The irascibility and impulsiveness of children are undoubtedly instinctive, and illustrate very strikingly the analogy between the child and inferior races. To a certain extent anger must be regarded as not only natural but legitimate, the protest of the infant against the discomforts of life. Outbursts of this kind, if neither excited by caprice on the part of the attendants, nor aggravated by punishment, nor ever, on the other hand, allowed to avail anything, soon become infrequent. In older children, as M. Perez remarks, "we should recognise in the passionate temper one of the most fruitful principles of human activity, one which, if united with sympathy, will lead to acts of self-devotion and may help in the formation of moral habits by obliging the child to examine himself and his own actions." On the other hand, as the same writer also says, anger "is the two edged sword of human wickedness, which wounds the striker as well as the victim. If indulged in too frequently, it will injure the moral and physical development of the child, who ought always to be surrounded by an atmosphere of peaceful serenity, and in whom we should endeavour to maintain calmness and tranquillity of spirit."

Love, Sympathy.—The simple feeling of pleasure in the young infant is very closely connected with its dependence upon the care of the mother or nurse. Hence we early find the outward manifestations of trust and love directed towards

the mother, and as the intellect develops and the imagination of the child enables him to enter into her states of feeling, we find the higher emotion of sympathetic love. Mrs Hall records that on the two hundred and thirty-first day "a cry from the mother caused by the child's vigorous use of his teeth was followed by a grieved cry from the child. The same proceeding was repeated later." A similar event may raise quite a different emotion. Miss Shinn's niece, in the fourteenth month, was trying experiments on herself with a sharp hairpin, when she "unexpectedly turned and tested it on me, and my movement and exclamation delighted her greatly."

The latter of these anecdotes illustrates a feature of the manifestations of the tender emotion which is often well marked even in children of four or five years of age, namely, that their love and sympathy, though very real and often very demonstrative, is to a large extent irreflective. Hence it is that we so frequently find children innocently wounding by their remarks the feelings of those they love.

Jealousy, Envy.—Children are naturally selfish little mortals, and their sense of proprietorship in the affections of their mother enters largely into the feeling of pain and aversion which the sight of other people may call forth. If these persons are seen to share the attention of the mother, aversion may give place to jealousy and hatred. Jealousy may appear early in the first year, but seems to be more common in the second. Darwin noticed that his child shewed jealousy at fifteen and a half months on seeing a doll fondled. Another child of the same age was jealous if sugar was given to its nurse. Another, also of fifteen months, was jealous if he saw his father and mother kiss each other and "would run up and try to separate them, scolding and pushing away his father who was by no means the favourite" (Perez). Envy arises from the desire to possess whatever pleasing thing is seen, and often because the child does not like to see anyone else possess something which he does not have himself. How little envy is dependent on any foresight of the pleasure to

be obtained from the coveted object is well illustrated by the following story from Dr James. A boy of five (who had been told the story of Hector and Achilles) was teaching his younger brother, aged three, how to play Hector, while he himself should play Achilles, and chase him round the walls of Troy. Having armed themselves, Achilles advanced shouting "Where's my Patroklos?" Whereupon the would-be Hector piped up, quite distracted from his *rôle*, "Where's my Patroklos? I want a Patroklos! I want a Patroklos!" and broke up the game.

The Æsthetic Emotions.—The æsthetic emotions form a very complex group which appear somewhat late in childhood, requiring as they do for their development, especially in their higher forms, some degree of intellectual culture and of emotional experience. Very diverse views have been held as to the nature and origin of these emotions, and child study seems likely to throw some light on the question. Perhaps the most interesting standpoint is that which regards them as closely related to play. Grant Allen indeed has suggested that play may be regarded as an exercise of the active functions, and the æsthetic feelings as a play of the receptive functions—a view which is more interesting than convincing. Both functions are frequently exercised jointly. Much of the play of children is highly imaginative and even dramatic, while motor activities are strongly called into play in various forms of art.

Studies of the æsthetic sense in children shew that there is little appreciation of beauty as such before the age of three years, and even for years afterwards the objects considered beautiful are those which are novel, which are brilliantly coloured, which call up memories of past pleasures, or which the child has heard admired. Young children, as a rule, prefer a coloured picture to a black and white one, however superior the execution of the latter may be. The subjects which appeal to them are those representing action, and especially of children enjoying familiar pleasures.

The love of scenery either in pictures or in reality is a

very late acquirement. Children indeed do not seem to *see* a landscape as such. They see a particular hill, or a house, or a clump of trees but do not take in the whole effect.

Appreciation of the symbolic aspect of nature is to a large extent a natural gift involving as it does a high activity of perception combined with imaginative powers. Possibly the germ of this side of æsthetic emotion may be found in the personification with which young children frequently endow natural objects, attributing to them their own feelings.

The Training of the Emotions.—The culture of the emotions has been a somewhat neglected subject especially amongst those moralists who regard ignorance as the root of all evil. The emotions have been set in opposition to the intellectual faculties and regarded as liable to interfere with the processes of judgment and reasoning. It must be admitted that this opposition is not altogether fanciful. A one-sided development of the emotions may certainly give rise to prejudices which prevent the proper play of intellect and give rise to a morbid sentimentalism. But, on the other hand, a too great concentration of the mind upon purely intellectual studies may result in a starving of the emotions and rob life of much of its richness and value. The mathematician who listened to a beautiful poem and then asked, "But what does it prove?" and Darwin's confession of his own loss of the love for poetry are the classic examples of what I mean. If we take the child himself as our guide in this matter we have no choice between the rival claims of the emotions and the intellect. The proper work of the child is harmonious growth.

The first aspect of emotional culture is that which attaches to moral discipline, and finds in the emotions the springs of action. Here the important fact taught us by the history of development is that the first conscious acts of the child before the first budding of intelligence are necessarily dependent on the feelings. All the movements of the child, the stretching of his limbs, his cries, his feeding, result in an

increase or a decrease of his pleasurable sensations, and a gradual selection of those which give rise to pleasure. The selfishness of young children is simply an endeavour to obtain those sensations which are remembered as pleasurable. In the whole-hearted devotion of the suckling to the business of feeding we may find the germ both of selfishness and sympathy, for it is through the recognition of the mother as the source of pleasure and the bearer of relief from discomfort that the instinct of love is awakened. But we find here also the germ of another instinct through which the mother obtains her strongest power over the child, and is able to foster those emotions which are helpful and to repress those which are hurtful. This is the social instinct, which is so strong in young children that any want of harmony between themselves and their guardians and companions is acutely felt. The repression of undesirable emotions is thus greatly aided by the disapprobation which they uniformly excite, while on the other hand the selfish love of the child, encouraged to act itself out in little deeds of service and self-sacrifice, may lay the foundations of sympathy and compassion.

The intellectual value of the emotions is found chiefly in the exciting of interest. Education has been called the science of interesting. Let a child once become thoroughly interested in any subject and his mastery of it will be limited only by his abilities and his opportunities. It has frequently been pointed out that a strong undercurrent of emotion underlies much of the best scientific work.

It should not be forgotten that many of the emotions have a strong intrinsic value, especially in the colouring they give to life. Children should be taught to appreciate and enjoy the beauties of Nature, of art, and of music, for to know the beautiful when we see it, to desire it about us, to strive to create it for ourselves, are amongst the ways to a fuller life

CHAPTER IX

Intellect

In previous chapters we have already said enough to show that the child's first learning is not from words but from things. "The first act of the human intellect," says Preyer, "consists in the ordering of the impressions made upon the organs of sense." By this process, which is termed perception, the child becomes aware of material things as the source of his sensations. "As everything that enters the mind finds its way through the senses, the first reason of a human being is a reason of sensations; this it is which forms the basis of the intellectual reason; our first masters in philosophy are our feet, our hands, our eyes. . . . That we may learn to think we must therefore exercise our members, our senses, our organs, for they are the instruments of our intelligence" (Rousseau). The progress of perception in the child is very gradual; it is excited by interest and curiosity; it implies attention, memory, discrimination, association; and these all prepare the way for the higher intellectual processes. The extent to which the early mental development of the child is independent of spoken language is well shewn by the case of deaf-mutes. The course of development in these children is so closely parallel to that of normal infants that the parents often fail to discover that anything is the matter until the child is two years of age or even older. They then seek medical advice because the child is not learning to talk, and are often quite surprised at the discovery that the child is totally deaf.

Amongst the earliest intellectual tendencies of the child none is of greater importance than curiosity. Of this we have already spoken as a "chronic hunger for new sensations." But curiosity is more than this, for with it comes the hunger for information, the desire to understand, and the instinct to

experiment. During the second three months of life children will stare about a room with eager interest and curiosity. They watch the movements of those about them, and they turn about to find out the source of sounds. After the art of seizing has been learnt the child soon begins to use his senses with purposive co-ordination, and spends his time in making all sorts of experiments with the different parts of his own body, and with everything within his reach. The intellectual element in the child's interest may be very apparent at an early age. Baby Hall on the two hundred and sixtieth day struck a cup with a spoon, and, liking the sound, repeated it several times. "He then struck a sauce-plate; as this gave a clearer, more ringing sound, he at once noticed the difference. His eyes opened wider, and with an absorbed expression, he hit first one and then the other as many as twenty times." So also Baby Preyer, when three hundred and nineteen days old, striking a plate with a spoon noticed the dulling of the sound when his free hand accidentally touched the plate, and continued to experiment by changing the spoon from one hand to the other and using the free hand to dull the sound. The same child in the fourteenth month took off and put on the lid of a can seventy-nine times without stopping a moment. His attention all the time was strained to the utmost shewing that his intellect was taking part. The sense of pain often becomes a subject for curiosity in the second year, and children often take pleasure in pricking, pinching, and slapping different parts of their person with a mixture of pretence and experiment.

The curiosity of the child finds a strong help-mate in the instinct of imitation which develops to a considerable extent during the second six months and impels him to strive to reproduce the movements and actions of his elders. Every fresh acquisition gives him the greatest pleasure, and as his power of observation increases and he gains more control over his movements, his imitative attempts become more ambitious, and their intellectual value more pronounced. Everyone who

comes in contact with the child furnishes "copy," and actions observed casually in the street, or words and opinions overheard, will be reproduced with the utmost impartiality.

A child of eight and a half months, after seeing his mother poke the fire, crept to the hearth, seized the poker, and thrust it back and forward in the ash-pan, chuckling to himself with great glee (Tracy). A little girl only fifteen months old had already begun to imitate her father's frowns and irritable ways. When three years old she said to a visitor with whom she had begun to argue quite in her father's style, "Do be quiet, will you, you never let me finish my sentences!" (Perez). Book-keeping was a favourite occupation with a little boy in the twenty-eighth month. Armed with paper and a pencil he would ask, "What did I spend?" or would soliloquise, "I did spend seventeen shillings for a haddock. I did spend fourpence at the grocer" (Herbertson).

Memory.—Memory has a physical as well as a psychological aspect. In the first place it corresponds to the property all material bodies possess of retaining impressions made upon them. As is now generally taught, the impressions received by the brain from the various organs of sense are recorded mechanically, and the record thus formed is called mechanical memory. This record must not be pictured as impressed upon a *tabula rasa*. On the contrary, at the time of birth the brain already contains a record of the experiences of past generations, an inherited tendency to select amongst the impressions reaching it, to record some and to reject others. Even in the first random movements of the infant we find an example of this primitive memory, for these, however irregular and purposeless they seem, have ever a decided tendency to arrange the limbs in the position they occupied before birth. The appearance of every instinctive movement we may also regard as the unfolding of the inherited memory of ancestral habits. In all this there is nothing absolutely inevitable. The inherited memory does not simply unfold as the result of a *vis a tergo*, but has to be called forth by the

experience of the child, which is recorded on the very substance of the growing brain. The brain grows not only *after* the pattern of ancestral habit, but *to* the impressions of individual experience, and in this way provision is made, provision infinitely greater than is the case in any of the lower animals, for individual adaptation and response to environment and education. Every child in repeating the experience of his ancestors and carrying out tendencies derived from them enters by individual acquisition upon his inheritance, his own experience graving deeper the lines of phyletic memory, or forming new adaptive combinations. I desire to emphasise this physical aspect of memory, because it enables us to picture in an exceedingly crude way the fact that the *individual* memory of everyone does not begin with the earliest incident he can recall, but with the first experiences of infancy. Many things which in after life have the appearance of intuitions, many likes and dislikes, many traits in the emotional character may thus result from impressions and experiences whose incidents cannot be recalled.

The ability to recall a fact is what is commonly meant by memory. It involves retention, and proceeds by the process of "association of ideas," whereby our perceptions, our ideas, our thoughts are woven into connection with one another so as to form a network in which all new acquisitions must take their place. To Mr Darwin the facility with which associated ideas were acquired seemed "by far the most strongly marked of all the distinctions between the mind of an infant and that of the cleverest full-grown dog." Mr Darwin records of one of his children at five months, "as soon as his hat and cloak had been put on, he became very cross if not taken out at once." Baby Hall by the eighth week had come to know that "the placing of a napkin under his chin was always followed by food, for he closed his eyes and opened his mouth." By the eighty-seventh day he had learned "that after his bonnet was put on he was taken out for a ride, and greeted both his own and his mother's bonnet with joy."

These are examples of association by contiguity, or perhaps by succession in time. Similar examples might be furnished of association by resemblance in appearance or sound long before the child is able to talk.

Even logical association in a rudimentary form may be noticed in this period. In association by succession we find the germ of the idea of causality. A baby of five months who has burned his finger in a candle flame will afterwards recoil at the sight of it. Darwin's boy at ten months had learned to look behind for the object which caused a shadow to fall upon the wall in front. Preyer's boy had learned by the time he was seventeen months to make practical use of such observations, for he fetched a travelling-bag to stand upon in order to get some playthings which were out of his reach.

A clear understanding of the principles of association is of great practical importance. As Perez says, "It is association which makes the unity of our mental existence, by establishing a natural bond between all the various parts of which it is constituted; and it is to association that we must look for the formation of the habits, judgment, character, and morality of children." Whenever a small child's attention is noticed to be aroused he should be allowed to gaze without interruption at the object of interest, and to touch and handle it, as in this way he is helped to form a habit of attending, and thus receiving distinct impressions. The intellectual development of phlegmatic children who manifest little pleasure in things about them is often much improved if they have their attention called to many objects of interest, and especially if they are permitted the companionship of more lively children. On the other hand, the lively impressionable child whose attention continually flits from one object of interest to another should have little to observe at a time, and be made to observe that little well. Toys which can be built up into numerous combinations, such as "bricks" or the kindergarten blocks with dove-tailed ends, have a distinct value in training the attention and forming the mind.

In all the teaching of children nothing which it is desired

that the child should remember should be allowed to remain isolated. Every new fact should be linked to old facts; if possible to both old and new activities. The things which a child remembers best are those which form the greatest number of associations in the mind; and these are they which are most interesting, which arouse attention, and which are repeated in as many ways as possible. The rational associations between different facts are specially important for intellectual development, and the young should be taught to find these out for themselves. They do so to a very large extent with all the things they learn for themselves by their own observation, but when they come to school work and book studies they are often quite extraordinarily blind to the existence of any connection of subjects with one another, or with things outside, and for this the teaching must be held wholly to blame. Mr Quick [1] tells us that in an elementary school he once put some questions about St Paul at Rome. He asked in what country Rome was, but nobody seemed to have heard of such a place. "It's geography!" said he, and some twenty hands went up directly; their owners now answered quite readily, "in Italy."

Imagination.—By imagination is meant the power of calling up before the "mind's eye" sensations previously experienced in the absence of the original stimulus. When such images are represented in their original setting we call the process reproductive imagination. When parts of several originals are combined in a single picture, the imagination is called productive or creative. We can have no imagination of sensations we have never experienced, but all our senses have their own special imaginations. Not only can we imagine things we have seen, but we can call up a mental image, more or less distinct, of all kinds of sensible experiences. Such images are frequently very vivid, as everyone knows who has ever been troubled by a tune continuing to "run in his head." Persons who are lacking in one of their senses naturally think in terms of the others. A blind man who

[1] "Essays on Educational Reformers," R. H. Quick, M.A., 1890.

has never seen can imagine objects only in terms of their shape, consistence, roughness, weight, and so on. He can form no visual images. One blind man asked if scarlet was not something like the sound of thunder.

The inquiries of Mr Galton and others have shewn that in different people the character of the imagination varies very greatly. Some persons are able to call up very vivid mental pictures of things they have seen, while others have this power in only a very slight degree. They may "remember" things seen, but cannot "picture" them in their mind's eye. So in other persons the images of sounds, or of muscular sensation, or of touch may be particularly strong.

It seems probable that, when we call up in our imagination past events, we are really exercising the same nerve structures as were concerned in receiving and interpreting the original sensations. But if so, how do we distinguish the mental picture from the reality? William James explains this by the hypothesis that when the cells concerned are excited by intracortical currents, that is to say subjectively, weaker explosions may be produced than currents from the sense-organs occasion. "To the strong degree of explosion corresponds the character of 'vividness' or sensible presence in the object of thought, to the weak degree that of 'faintness' or outward unreality." In support of this he notes the difficulty often experienced in distinguishing whether very faint impressions are real or imaginary; "of a baby crying in a distant part of the house, we are uncertain whether we still hear it, or only imagine the sound."

The childish imagination is characterised especially by its vividness, and this no doubt is due to the strong impressions of which the child is daily the subject. To every healthy child "the world is so full of a number of things" that every day is a new day and not merely an old day over again. But before a child is able to reproduce past impressions he must have had time to form them clearly, and the passage of reproductive into productive imagination can only take place after he has had sufficient experience to create a mental world for himself.

That very want of experience which restricts the childish imagination in so many ways no doubt aids in giving objectivity to their mental images. Many children even up to the age of four or five have considerable difficulty in distinguishing between their dreams, their own imaginings, and real events, and not infrequently they will tell most circumstantial stories of adventures they have met with which really have a very slender foundation in fact. In this there may be no intention to deceive, yet truthfulness is too essential a virtue for such a habit to be safely left to work its own cure without assistance. The proper method of discipline for such childish exuberance of the imagination is to develop in the child a sense of the practical value of accuracy, and of the moral value of truth. The greatest care may be necessary lest such a child should be unjustly punished for falsehood.

The imagination of children has free play in their dreams. "Dreams," says Perez, "are the poems of children." The events of the day reappear, but strangely jumbled together, and mixed with fantastic details. The influence of dreams in giving rise to painful emotions or increasing the nervousness and timidity produced by a fright or by threats has already been referred to.

At an early period the imagination of children leads them to notice analogies between different objects, and helps them to understand the world about them. A child a year and a half old who had been accustomed to play with the kindergarten balls one day swung them to and fro like the pendulum of a clock, while he said "Tick-took, tick-took." Another child, two years of age, who had learned to bow ceremoniously to his friends, was seen one gusty morning looking with puzzled interest at the swaying branches of a tree. Suddenly his face cleared, and he too began to bow. "How do!" he said, "how do!" (Harrison.) Another, seeing a crust dipped in a cup of tea, exclaimed delightedly, "Ba! Ba!" (Bath!). (Sully.)

The mimetic play of children illustrates very well both their exuberance of fancy and the limitations imposed by

want of knowledge. In such play the child requires some material objects with which to exercise his inventive imagination, but often prefers playthings of his own contrivance to the verisimilitude of purchased articles which chain his fancy. "We don't like buyed dolls," says Budge, in "Helen's Babies."

While toys thus assist the play of the imagination, fiction and poetry are of great value by permitting the child to share the imagination of others. Even Rousseau, who declares, "I hate books, they only teach people to talk about what they don't understand," acknowledged the intellectual value to the child of Robinson Crusoe, which was to form for a long time the whole of Émile's library. To be of value to the child, tales should not be mere reproductions of their own experiences. Indeed such tales only please very young children. With the growth of experience children delight in the free play of their imagination in regions where the ideas and activities of the inhabitants are bound neither by the humdrum of custom nor by the laws of a prosaic world. What are all the legends that have come down to us from a far-off past but a record of how in all ages man has felt that he ought to have dominion "to the ends of all the earth"; that though the forces of Nature might slay him, yet was he mightier than they?

Up to the age of ten years fairy-tales and folk-lore of this description appear to be of preponderating interest, but after this the rapid growth of the critical spirit gradually changes the centre of interest from the marvellous to the adventurous. The æsthetic and ethical value of all good fictional literature is closely bound up with the imaginative and intellectual.

The enormous growth of a special literature for children in recent years has in many ways been a great boon, but it can hardly be denied that it has also made it a little more difficult for children to form any permanent friendships among their books. A child who is wantonly supplied with books, all too carefully written down to his level, can have little chance of gaining any natural appreciation of style, or of overcoming

the initial effort required to read books which have a place among the classics. Perhaps the simplest way of gaining a place in the child's affections for some works of permanent value is to read them aloud to him and talk about them. Many of the great works of literature may thus weave themselves into the family life, and attract and interest a child long before he would care to read them for himself, and at a later period when he does read them old associations render the reading easy and pleasant, and greater knowledge and culture lead to the appreciation of beauties previously unseen.

Judgment in its simplest form is involved in perception, or the recognition of objects before us. Such judgments are formed at a very early period of life in direct response to dominant sensations, which the child learns to recognise, and they, in turn, suggest past associated experiences. These suggestions, proceeding thus by the process of association by contiguity, call forth reactions on the part of the child which are, in fact, rudimentary acts of reasoning of a very direct and practical nature. Such actions, being neither reflex nor instinctive, and preceding conceptual ideation, have been termed *receptual* by Romanes. A recept is an idea which is an advance on a percept, but less general or abstract than a concept. It is just such a vague and indefinite generalisation as we may suppose an animal, or a young child with a very limited vocabulary, to be capable of. A water-fowl, in adopting different modes of alighting on water or on land, evidently has one recept corresponding to a solid and another to a fluid. Man, abstracting the qualities of these recepts and bestowing names upon them, raises them to the rank of concepts and renders them available for productive reasoning, although "so far as the practical purposes of locomotion are concerned, it is, of course, immaterial whether or not he thus raises his recepts into concepts." [1]

Association by contiguity is the law in accordance with which the receptual mental activities of children are carried

[1] Romanes, "Animal Intelligence."

on, and examples of the practical (reproductive) reasoning of this kind of which even young infants are capable have already been quoted. Even after children have begun to talk, it is in reasoning of this kind that they excel; but no great advance can take place in the development of intellect so long as the mind is bound by such habitual sequences. The tendency of children to be struck by resemblances between different things and to reason by analogy, plays a much more important part in their mental development.

When the child begins to talk, he at first uses words in a very general way, not because he is able to generalise, but because he is so open to resemblances, and so blind to differences that the words he knows are called up by whatever reminds him of anything he has learned to name. He continues so to apply his terms long after he is able to distinguish the individual things so named, but he is thus, by making use of names, led all the more carefully to compare and take stock of both the resemblances and differences of objects which seemed similar. In this way he gradually acquires a stock of definite concepts, grouping things, qualities, events into classes or kinds which furnish a basis for the higher rational processes by which conclusions are reached not directly but mediately. In all this the child is greatly helped by the mistakes he makes, by things not answering to his expectations, and by hearing different terms applied to objects he thought similar. He is thus compelled to observe carefully, and to discriminate accurately the elements of the thing before him. In proportion as he is able to do this, his judgments and inferences become more rational, because his train of thought is no longer run only on the lines of association by contiguity, but he is able to pick out resemblances from among apparent differences, to concentrate his attention on the qualities in the object of his thought which are essential to his present purpose, and thus to bring new experiences under old generalisations.

Speech.—The acquisition of speech furnishes one of the most intelligible examples of Nature's method of teaching,

and of the *rôle* which is played by instinct and training respectively. Nature educates by exciting cravings, by implanting instinctive tendencies, and by associating pleasurable feelings with the exercise of normal functions. By these means the difficult task of learning his mother tongue becomes to the child a source of keen gratification and interest.

The first cry of the infant must be regarded as having only the significance of a reflex, but, during the first few weeks of life, modifications of the cry come to be expressive of various elementary physical needs, and of the associated sensations of discomfort. During the same period pleasurable states begin to call forth the infantile babbling which, with its accompanying smiles and gestures, is soon to constitute so great a charm. The child soon begins to find pleasure in exercising his voice, and in repeating, with great persistence and often with a great variety of modulation, a few syllables chiefly composed of vowel sounds (ä, ā) with the consonants m, b, p, t (am, ma, ba, etc.).

All these significant sounds and gestures, common to the children of different nations, and readily intelligible by any adult, are obviously instinctive in character, and form the first language of the child. They not only serve the useful function of exercising the lungs and the muscles of respiration, but also furnish a preliminary exercise for the vocal organs. During the first eight or nine months of life a large proportion of the sounds afterwards to be required in speech can be distinguished in the infantile babble.

During the second six months of life there is a marked advance in the comprehension of words and gestures, and a distinct step is taken when the child begins to imitate the sounds he hears. The cadence and rhythm of conversation is often closely imitated before the child attempts to pronounce actual words, so that the babble has a curious resemblance to the sound of persons talking. Between the ninth and twelfth months a few words are usually used with intention. The speech at this time is of an interjectional character and reduplicated syllables are freely used—da-da, ma-ma, etc.

During the third six months the advance is often rapid. Various sounds used by the child may come to have a definite meaning attached to them, and this is often spoken of as the invention of words by the child. Many children now begin to use short sentences, which, though expressing complete ideas, are at first elliptical, *e.g.* Papa gone, for Papa has gone. During this period alternate accelerations and retardations are often noticed in the development of speech. The acquisition of the power of walking may also interfere somewhat with the progress of speech.

During the fourth six months rapid progress is made, especially in the enrichment of the vocabulary. Nouns are often stated to form from 60 to 80 per cent. of the words acquired at this period. The number of verbs used is usually very small. This appears to be due chiefly to the fact that the subject and the object are the parts of the sentence which require the most distinct expression in words, the verb being indicated by pantomime and intonation. Words are not distinctly differentiated into different classes, so that any part of speech may function as any other part, or single words may express a whole sentence.

The rapidity of speech acquisition varies greatly in individual children. Parents are often unduly anxious if a child is late in learning to speak. Slowness in speaking is not always a sign of want of intelligence, and the children of cultured parents are not infrequently very backward in this respect. For example, a child of my acquaintance, of highly cultured parents, could scarcely speak a word at the age of two years, but soon after this speech developed very rapidly. Perez says on this subject, "It seems to me that the more intelligent a child is, the less he uses words, the more necessary is it to him that words should signify something if he is to learn them, and this is why he only learns words in proportion as he gains ideas about objects." Preyer connects the tendency to make use of words with other forms of imitation. "Probably," he says, "those that imitate early and skilfully are the children that speak earliest, and whose

cerebrum grows fastest but also soonest ceases to grow; whereas those that imitate later and more sparingly, generally learn to speak later, and will generally be the more intelligent. For with the higher sort of activity goes the greater growth of brain." It is at any rate certain that the instinct of imitation frequently leads to the repetition of many words and phrases whose significance is unknown. Many of these words are afterwards forgotten, and many become associated with the proper ideas, but there is a danger that, if the memory is too early filled with words, these may to some extent take the place of ideas—a danger which is by no means confined to young children.

CHAPTER X

The Will

In the new-born babe there is no appearance of volition, but as the child grows the will appears very gradually. The only sign by which we can recognise the development of the will is muscular movement. Willed or voluntary movement presupposes the existence of ideas, and therefore cannot occur until the development of the senses and of the intellect is sufficiently advanced for the mind to be furnished with ideas which can be desired or willed. The development of the will is, therefore, dependent upon preceding phenomena. It must, however, be clearly understood that all that is to be said as to the evolution of volitional control has reference to sequence only, not to cause.

The simplest operations of the will may be said to be concerned with two sets of phenomena; on the one hand with ideas, and on the other with movements. A voluntary movement is the outward expression of an idea. In order that a movement may be willed, there must be in the mind an idea of the movement, and a desire to carry it out. When a movement has been performed voluntarily a number of times

the idea of the end desired gradually replaces in consciousness the idea of the movement.

In studying the development of volition in the child we must therefore consider (1) how the mind is furnished with ideas of movements, since these obviously must be present in the memory before they can be desired; (2) how a given movement is to be recognised as voluntary.

1. ***The Furnishing of the Mind with Motor Ideas.***—Whenever a motor discharge passes from the brain two effects follow. The first and direct effect is the occurrence of a muscular contraction. But this effect in its turn becomes a cause and sends back to the brain a sensation of movement. We have already seen that the young infant in his waking hours is in constant movement, and that even in sleep numerous movements, chiefly of the random kind, occur. All these movements, we may believe, from the very first, furnish sensations of muscular activity, which blend with all other forms of sensation in the consciousness of the child during his waking hours. Amongst these movements there occur and recur some which, often owing to their association with particular sensations other than their own, make a peculiarly deep impression on the awakening consciousness of the child. Out of the general level of undifferentiated muscular sensation such impressions rise up into clearer consciousness, and produce a reaction on the part of the child which is the simplest form of attention. Attention of this sort is not a voluntary act. It occurs apart from the operation of the will. It is simply a *detention* of the mind, whereby certain impressions, instead of passing into oblivion, "get taken," as it were, by the memory. The operation of sucking, for example, may attract attention in this way at an early period. As Perez says "the child delights in the operation, and as it were listens and looks at himself and feels that he is enjoying himself." As soon as such sensations begin to attract the attention of the child movements unconnected with the sensation tend to be inhibited, and especially the random ones. At first this inhibition may be

merely momentary, but even during the first few weeks of life we find the random movements tending to disappear as the sensations of the child become more vivid, and acquire a greater degree of directing power over his movements. This inhibiting effect of attention is of great interest and importance. We may indeed define attention as an adaptation of the nerve structures to admit certain impressions to consciousness to the exclusion of others, combined with a tendency to limit the outgoing strain of motor impulses to those connected with the impression or idea which fills consciousness. The act of attention in fact permits certain vivid or novel impressions to seize upon the consciousness of the child, to have the child all to themselves as it were, so that the associated sensory and motor ideas are imprinted together upon the memory. Through such recurring acts of attention the memory of the child is gradually furnished with a supply of motor ideas which in due course he will be able to recall and deliberately will.

2. ***The Recognition of Voluntary Movement.***— A young child's ideas are thus seen to spring very directly from the impressions which attract his attention, and they tend to pass very directly into action. Such attention is at first, as we have said, entirely passive. The attitude of the child is that of an onlooker who experiences a degree of satisfaction as he observes the idea to which he is attending passing into action. The movement becomes volitional when the child is no longer content to be merely a passive spectator, but interposes between an exciting sensation and a movement his own desire and intention to perform. Catching sight of an impression, if one may so say, as it rises above the threshold of consciousness and brings with it the idea of pleasurable movement, he throws himself forward upon it with desire. "Let me do it myself," is his mental attitude. So he wills and it is done. The first act of volition is therefore an act of attention. The child *wills* to attend to something which has first caught his attention. The first voluntary movement is simply the outward sign of

the motor idea to which the child wills to attend. The characteristic feature of a voluntary movement is therefore wrapped up within the consciousness of the child. There is no criterion by which we can definitely ascertain when a non-volitional movement is for the first time performed with a will. Our only guide is the appearance of interest and desire in the child's aspect, and this is a matter of interpretation.

Preyer fails to find proof of definite volition before the end of the third month. Probably we shall not be far wrong if we say that about this period the will first manifestly begins to assume some control. As the child's ideas become more sharply defined, his desires become more keen, and we find the number of voluntary acts rapidly increasing.

During the imitative period of babyhood the child's observations of the actions of those about him form a new source of motor ideas, or rather of ideas of new combinations of movements, and the pleasure of carrying these into effect becomes one of the chief joys of living. Professor Baldwin considers that such imitative movements furnish the first clear proofs of volition. "The normal child's first exhibition of volition," he says, "is found in its efforts to imitate something, and what it imitates, its 'copy,' is of two kinds (1) something external, such as movements seen or noises heard; (2) something internal arising in its own memory, imagination, or thought." It is difficult however to see how a child should imitate new combinations of movements until he has made the discovery that he *can* make old ones, that is that he can will them. If we must have a definitely recognisable criterion before we may call a movement voluntary, no doubt we must wait for the occurrence of such imitation of something external as Baldwin desiderates, but if the essential act of the will is to be found in the effort of attention it seems impossible to deny that the will does become active in the imitation of movements which had been hitherto entirely, and are still chiefly, instinctive in their performance. Nature abhors a sharp line of division as she abhors a vacuum, and whatever the will may be the evidence seems to point to

the conclusion that it assumes control gradually, and in the first instance over movements already "there."

Instinct is of considerable importance in determining the course of the development of voluntary muscular control. Instinctive movements, attended by the pleasurable feelings which accompany all exercise of function, naturally attract the attention of the child, and thus at an early period furnish "copy" for their more or less voluntary reproduction, when the outward occasion for their exercise again presents itself, and recalls to the child's memory the past pleasing associations.

Inhibition.—"Don't say don't" is a pedagogical maxim which recognises the comparative inefficiency of a merely negative training. Inhibition, the will not to do, is more difficult and comes later than the will to do. It is preceded as we have just seen by the involuntary inhibition of movements which are not being attended to. Some power of active inhibition may be noticed during the second six months of life. In a carefully trained child this is manifested in the acquisition of control over the excretions. When the child awakes from sleep feeling uncomfortable he desires to relieve himself. But along with the idea of present relief there arises also the idea of the discomfort which will follow. To the latter idea he directs his attention and cries to attract the attention of his nurse. But the child's power of attention is very weak and ill-sustained, and his imagination is unpractised, and so, if he is not attended to immediately, the more pressing solicitations of the actual discomfort force themselves upon his consciousness, and an accident results. Inhibition of movement is thus to be understood as a positive action of the will, a deliberate turning of the attention to a contrary idea. It is an important epoch in the child's development when he begins to discover that he can do this. When the child is at this stage, often in the second year of life, we may meet with the phenomenon of contrary suggestion. Everything which is proposed meets with opposition from the child. If you wish to shake hands with him he puts

his hand behind his back. He objects to being taken out and resents being brought in. In the morning there is a struggle before his clothes can be put on, and at night a storm before he goes to bed. Disobedience of this sort is not to be taken too seriously. The child is learning that he *can* obey and disobey. He is discovering his personality. He is learning that he is an agent. The treatment should not be coercion. Disapprobation, uniform and not too strongly expressed, patience, and if possible the example of older children, will usually soon lead the child to recognise that voluntary obedience is the price of happiness. Occasionally this form of contrariness becomes really troublesome, especially in children who have been spoiled. In such cases the most effective plan is simply to *make* the child have his own way. If he won't get ready to go out, let him understand that if he is not ready in time he will be left behind. If he won't let himself be dressed in the morning, insist on his staying in bed for another hour. If he won't take his breakfast, send it away. The child readily understands the justice of retributive punishment of this kind, and is even helped by it to a judgment of the nature of his own acts. As his self-knowledge thus awakens, he begins to desire the acknowledgment of his personality by those about him, and this instinctive craving for approval for himself and his conduct adds itself to his natural imitativeness and suggestibility in overcoming a phenomenon which often gives a good deal of annoyance in the nursery.

The Effect of Voluntary Exercise. — Voluntary activity thus arises by the gradual acquisition of control over the movements. In this the feeling of satisfaction associated with certain actions, the instinctive tendency to imitate the movements of others, and the natural disposition of the child to carry out any action suggested by word or sign, all aid in the development of command over the bodily powers. Underlying all these is the natural restlessness of the child, and the strong interest he feels in his own movements quite apart from their results. A healthy child desires to be doing

anything rather than sitting still, and games and toys are often valued in direct ratio to the amount of activity which they call forth. All the occupations of childhood which give command of the muscles, and lead to the graceful and exact performance of bodily movement, thus play an important part in the development of the will. That such command of the instruments of the will should be as complete and perfect as possible, the child must have ample opportunity for the exercise of his powers, and the example and stimulus of suitable companionship. He should not be allowed to be too easily satisfied with his own performances, but must be encouraged to persevere in the accurate carrying out of his desires. The cultivation of correct pronunciation, of distinct articulation in reading and singing, of a proper choice of words, of neatness and dexterity in the use of the hands, and of accuracy of observation, all these are a training of the will in so far as they involve effort, attention, and perseverance.

The Character of the Child's Will.—In a little child without experience, without foresight of any but the immediate consequences of his actions, it is natural that the will should be very impulsive, governed by feeling and not by reason. What he desires and wills to do is what he likes at the moment. What is called the wilfulness of little children is really indicative of weakness rather than of strength of will. The will is open to the influence of only the simplest motives, because these alone are understood and attended to.

So long as the child's actions are entirely impulsive, excited by the cravings of the moment, he is still in the animal stage of existence. But with the development of voluntary control over his movements various interests are aroused. His growing intelligence enables him to understand the immediate and remote effects of his actions, and at an early period we find a strong tendency to pursue definite ends. In this tendency we may find the beginning of the child's ethical development, for with the growth of self-knowledge he learns to pass judgment upon his actions and to submit himself to the influence of ideals of conduct. The ability to rule the

conduct by such ideas in accordance with the laws of right, and to sacrifice immediate gratification in the pursuit of distant ideals is what is commonly meant by self-control. The recognition of worthy and enduring ideals, and the *feeling* of the relative moral value of different courses of action, are matters of experience and must therefore be a work of time. Such ideals are part of the heritage of the race, but they are not transmitted as such to the child. They must be acquired by each generation afresh. This is the function of training. To train a child to feel and recognise the higher motives of conduct is an important part of moral education. To train him to subordinate to such motives the promptings of the lower appetites and impulses is the most important aspect of the training of the will. In this the function of the educator is twofold; firstly, to ensure that the lower forms of appetite and impulse are so guided and controlled from the first in accordance with the higher principles of conduct that when the child awakens to a knowledge of these, he may also discover that their claim on his allegiance has already been unconsciously recognised by his practice; secondly, to encourage the growth of interests which tend so to strengthen the higher forms of desire that the child may find his freedom in willing to do what he ought. To express the matter in another way, the child must learn to obey in order that he may rule. He must be taught, somehow, to obey, because the soil for the growth of his moral and spiritual life can only be prepared by the discipline of the lower impulses and desires. But in order that he may not remain dependent on the will of another, obedience must as far as possible be secured, not by coercion, but by creating desires for right conduct and by allowing him, so far as he can be trusted, liberty of choice.

Self-Control.—The fundamental aspect of self-control is the ability to resist temptation to sensuous gratification. Children are frequently spoken of as creatures of the senses. There is no more important aspect of the child's early nurture than its influence in guiding nature in the selection of a favourite

teacher from among these "first masters in philosophy." As I suspect common opinion to be a little unjust to the normal character of the healthy child, and a little too ready therefore to make allowances for his supposed natural propensity to greediness and covetousness, I am pleased to observe Miss Shinn's summing up of her notes on the development of the senses in her niece, to the effect that "the higher senses led from the first in the child's psychological activity. So far from finding an early dominance of taste and smell, displaced later by that of the senses that supply more mental interest, I found a lively attention to sight impressions very early, slowly overtaken by attention to other sensations in direct rather than inverse order of their intellectual importance." The gratification of appetite is certainly an important interest in childhood. But this interest is naturally awakened by hunger, and when this is satisfied the healthy child is quite ready to be led off by other impulses and interests which minister to the divine hunger of curiosity. A wholesome nurture will therefore see to it that the child has ample freedom to experiment and explore. It will encourage him to seek pleasure in the activity of healthy play. It will seek to multiply all wholesome interests and enjoyments. In the second place it will strive to form and strengthen the will, negatively by starving any undue tendency to seek pleasure in sensual indulgence, and positively by exercise in self-restraint. The importance of avoiding the cultivation of artificial appetite in young children is far from being sufficiently recognised. Yet all practices which teach the child to dwell upon the pleasures of appetite; the rewarding of obedience or the soothing of irritability by dainties which gratify the palate; the indulgence of the child in whatever is going at table, or in whatever he pleases to cry for, knowing well by past experience that his parents will at length, like the unjust judge in the parable, be wearied by his much lamenting;—all these directly and greatly increase the difficulty of all subsequent training in self-control. In these matters, so far as the mere indulgence of appetite is concerned, the

child is entirely in the hands of his guardians. But it is important that his training should not be merely negative, but that little by little he should be exercised in *self*-restraint, in good-natured submission to restriction or deprivation; in the deferring of present satisfaction to future gratification; in the restraint of haste in eating, of greediness, of covetousness; in sharing his pleasures with others, and in willingness to subordinate his personal desires to the common welfare.

The power of controlling exhibitions of feeling and passion is very slowly acquired. The child's early outbursts of passion are instinctive reactions without moral significance. They are experiences which, for the time being, overwhelm him by their intensity. They serve the purpose not only of increasing his stock of emotional experience, but, if rightly guided, of affording play for the exercise of self-control. The prominence of suggestibility in the child is a powerful instrument in the hands of anyone who understands the working of a child's mind, and renders it easy, in the period of reaction which follows a storm of passion, to awaken him to a sense of the evil of uncurbed outbursts of emotion, and to instil into him those ideas and motives which will stand by him and help him when he again feels he is losing his self-control. Self-knowledge and self-judgment thus prepare the way for self-direction. There is, perhaps, no child whom education can do more to make or mar than one in whom a generous disposition and a passionate temperament go together. Crush all outbursts of emotion, carrying the day if need be "at the point of the sword," and the flame will smoulder, inwardly nourishing the roots of all forms of selfish anger. Guide them into the service of the will, and they lay the foundation of a hatred of wrong and a generous scorn of evil.

All forms of self-control involve in some measure control of the thoughts. It is not enough that the outward expression of unlawful desire and passion should be checked. The direction of the thoughts must also be completely and resolutely turned until the mind rests in the possession of the

higher motive. Until the will is able to do this the evil is only cloaked. As St John strongly expresses it, "Every one that hateth his brother is a murderer," for hatred only waits for opportunity to inflict the direst evil. But the power thus to see the higher, and to accept its claim when the importunity of the lower is urgently felt, is necessarily of slow growth. Yet here again the openness of the child's mind to suggestion renders it possible to multiply all worthy motives of conduct. Inasmuch as the various lines of association reinforce one another, even the lower motives of right conduct, such as personal affection, or desire for praise, may be fitly used to supplement and strengthen the higher, reverence for what is right, provided they are kept in due subordination.

The exercise of the will in the control of the thoughts is as important a part of mental as of moral training. Here the power of concentrating the attention on the work in hand is the main point to be secured. The child's mind is naturally as restless as his body, and unless strong interest in the subject can be aroused, he lets his wits go wool-gathering. Interest, therefore, must be secured, and whenever possible should be intrinsic in the subject. Especially ought the power of observation to be exercised in the discovery or the recognition of the innumerable links which connect all new bits of knowledge with common well-known things. The will is also exercised in the concentration of the attention required in learning anything by heart, or in such practices as mental arithmetic, where mental operations have to be performed with speed. Finally, the child must be taught the habit of attending to whatever he is engaged in. Dawdling over a book, or a task, or anything else, is not merely a waste of time, but a positive evil, weakening the power of concentrating the mind upon a subject.

Free Will.—The term free will popularly refers to the feeling of freedom which attends the ability to determine one's actions by ideas. In proportion as the lower motives of conduct cease to appeal to us, and we become able to set

aside all conflicting impulses without any sense of loss or renunciation, we gain the sense of harmony between our conduct and the ideal law of our life, and feel that we are free. Free will in this sense is the aim of all education of the will. It is an aim which cannot, of course, be accomplished in childhood, if indeed it can ever be accomplished altogether in this life. Nevertheless, it is only by keeping this end in view from the beginning that harmony can be attained between discipline and freedom. Discipline means control. It often means restriction. But if the end of discipline be freedom, the discipline must be such as will restrict, and restrict effectually, those impulses and desires which interfere with freedom. Every act of will is in reality an act of choice, and every act of choice implies restraint. We can attend to nothing without restraining impulses to attend to other things. We can choose nothing without rejecting the alternative. Hence, in the training of the will, restriction is necessary in the first place to prevent the choice of the lower in ignorance or caprice, and in the second to define the direction in which choice will give the largest freedom.

No greater mistake can be made than to suppose that a reasonably strict discipline interferes either with a child's sense of freedom or with his happiness. A very large part of a child's happiness consists in a sense of harmony with his surroundings, and the child naturally seeks for this by striving to assimilate his conduct to the examples, customs, and ideals he finds about him. Such harmony is obviously unattainable under a shifting discipline which permits one day what is forbidden the next. Hence one object of any discipline which has the child's happiness at heart should be to define as clearly as possible the limits between what is permitted and what is forbidden, between what is right and what is wrong, for only in this way can the child form any clear conception of the ideal of conduct which is considered suitable for him. This definiteness can only be attained by a consistency analogous to that by which Nature teaches the child

the limitations imposed upon him by the physical world. The absoluteness of the laws of Nature do not produce in the child a sense of his weakness and helplessness, but on the contrary, by defining what is possible and what is impossible, awaken in him a delightful sense of growing power. So also a discipline which, while suited to the child's stage of development, is absolutely consistent and unwavering in its requirements, if felt to be restrictive in times of forgetfulness or impulse, serves chiefly to define those ideals of conduct towards which he is attracted by his desire for harmony, his love of approbation, his pursuit of pleasure. How closely related discipline is to happiness is nowhere better exemplified than by the well-known fact that, next to actual ill-usage, there is no quicker way of making a child unhappy than by simply giving him everything he wants. Attend to every caprice, supply him at once with everything he fancies, praise everything he does, and in an incredibly short time he will be an ungoverned, miserable, spoiled child.

Having said so much on the necessity of control, let me now conclude by referring very briefly to the necessity of liberty. Necessary as control is to define the child's ideal, it is in itself negative and unproductive. It is without power. It does nothing to strengthen the will on the positive side. The will can only be strengthened by voluntary activity, hence the child must be taught to love whatever ideal of conduct it is sought that he should follow. Hence, also, the ideal must be a child's ideal and must appeal to him through all worthy motives of conduct—a child's motives, not a man's. Yet do not urge motives more than necessary. Take for granted that the child desires to do right. Trust him, and let him know that he is trusted. Do not promise him either happiness or approval as a reward for doing right, but let him feel that he obtains both. When restriction is necessary and right, let the child be held to a perfectly faithful account, that the feeling of order and of law may gain a hold upon him, but do not let any sense of conflict with duty be felt unnecessarily. It is often an assistance to

have a definite time for the performance of certain duties, and even then to be careful not to remind the child too abruptly of what is expected of him. The announcement of bedtime, for instance, need not fall like a bolt from the blue just when the child is in the excitement of play, or engrossed in the most interesting chapter of his book, even though discipline must be maintained. Let the child have reasons for commandments when he is able to appreciate them, but do not teach him to expect them or to wait for them. As far as possible couple negative commandments with some alternative so that the child may feel that he has some freedom of choice.

Lastly, do not expect too much of the child. Moral forcing is at least as dangerous as intellectual. Sensitive children may easily be led to develop a very keen sense of right and wrong at an early age, but we cannot but tremble for the future of a child who has to consider the ethics of all his actions at the age of five, or who feels the "sense of sin" at seven. One can hardly be too careful not to worry such children over trifles. On the other hand, with high-spirited, headstrong children great patience is often needed, and even guidance through a course of trial and error, in order that the will may be led to choose the right.

CHAPTER XI

Habit

"HABIT," wrote Carlyle, "is the deepest law of human nature. It is our supreme strength; if also, in certain circumstances, our miserablest weakness." "Habit is our fundamental law; Habit and Imitation, there is nothing more perennial in us than these two. They are the source of all Working and Apprenticeship, of all Practice and Learning, in this world."

Definition.—Habit, in the wide sense of the term,

means that all the functions of living creatures tend to repeat themselves, or at any rate to become easier by repetition. The law of habit reigns not only in the domain of action, but also in the domains of feeling, and of thinking.

The Physiology of Habit.—Habit depends fundamentally on the plasticity of the nervous system whereby all nervous currents tend to leave their traces in the paths they traverse. The currents which enter the young brain through the sensory nerves not only stimulate the brain to grow, but they seek outgoing channels which are manifested by the movements resulting. Every time a sensation-action circuit is traversed the path is made deeper and the action tends to be more readily repeated. It is for this reason that the most trivial acts are of importance. They are not isolated. They tend in similar circumstances to recur and to give rise to habits. The plasticity of the nervous system upon which habit depends is greatest in the young. Efforts which are made while the brain is actively growing give direction to the processes of growth. Hence it sometimes happens that where persistent efforts have been made to acquire some new movement with only partial success, the desired result is attained quite easily on a renewed attempt after a period of rest. "After one has done all in one's power, the nervous system does the rest."

The simplest habits occur as the reflex response of the nervous system along some beaten pathway of discharge; the most complex depend upon a physical basis of an associated system of such paths. Habits, in short, are artificial reflexes. Upon the possibility of laying down the lines of such reflexes all education depends.

The Practical Effects of Habit.—Habit may be regarded in the first instance from the practical standpoint as a labour-saving device.

(1) Habit enables us to carry out our actions more accurately and promptly and with less fatigue, or in other words, practice makes perfect. In learning to use the muscles in any new way the attention is at first strained and

energy is exhausted in the effort. The required movements are likewise executed awkwardly. But every repetition renders the movement more and more easy, and at last actions which at first could be carried out only with the greatest difficulty are performed promptly and accurately and with little or no sense of effort.

(2) Habitual actions are carried on with a minimum of conscious attention. The simplest habits are performed with the unconsciousness of reflex actions. If they enter into consciousness at all, they do so during or even after their performance. More complex habitual actions similarly require scarcely any conscious attention save in the necessary effort to start. Examples of these practical effects of habit are supplied by every act of our daily life. We should never have learnt to stand, or walk, or run, to button our clothes, or tie our boots, if we had had to begin each morning as to a fresh task. But in learning these things and a thousand others not only has practice made perfect, but the more habitual of our actions are performed almost without consciousness.

(3) Habit not only renders particular actions easier of performance, but particular kinds of actions. The man who has never handled any implement of greater precision than a plough-share or a pruning hook will have much greater difficulty in learning an occupation requiring a finer co-ordination of movement, such as woodcarving, than an artist or a draughtsman. In this way habit not only lays down lines of association, but in a sense it furnishes momentum. Hence the importance of the early training of children in order that the force of habit may in due time assist volition.

Intellectual and Ethical Aspects of Habit.—Habit has a more important aspect than those already considered. If habits were merely a device for rendering our acquirements stable, and enabling us to go our daily round with faultless uniformity, we should end our life where the ants and bees begin. And indeed all our regularities of habit do tend to become purely automatic in their perform-

ance, and regarded from the outside might seem to have no greater value than inborn instinctive activities. But regarded from within, habit acquires a new significance as the process upon which our mental life is built. All mental phenomena develop through an ascending series of stages, and on habit depends the possibility of the passage from stage to stage. Perception, for example, depends upon the formation and habitual association of certain pathways for nervous currents. Memory, imagination, reasoning, the association of ideas, etc., likewise depend upon the law of habit. All our activities which have been individually acquired, yet in the end are performed with the unconsciousness of instinct, have been necessary steps in our development. They tell not only what we do, but what we are. This may be rendered more clear by considering the relationship between habit and instinct.

Habit and Instinct.—It has been already recognised that the evolution of intelligence has been closely associated with the replacing of instinctive acts by habits individually acquired. The relationship or at any rate the resemblance between habit and instinct is recognised in common parlance when we speak of any acquired activity which has become habitual as "instinctive." The same relationship is recognised in the definition of instinct as inherited habit.

It was at one time believed that animals were provided at birth with a complete range of instincts perfectly adapted to guide them without fault or failure in all the possible circumstances of life. But no one now believes that animals are nothing but conscious automata. There are abundant facts to prove that instincts are neither altogether blind nor altogether invariable, but may be modified by individual experience, education, and intelligence. Birds, for example, which have been hatched and brought up alone, do not sing the characteristic song, nor build the characteristic nest, of their kind. Even ants, wasps, and bees, which furnish the most marvellous examples of the complexity and the perfection of instinct, doubtless exhibit also individual psychical variations. As examples of these are not yet numerous, I will quote one

illustration from George and Elizabeth Peckham. "We have now and then," they say, "seen a queen of *Polistes fusca* occupy a comb of the previous year instead of building a new one for herself, shewing a better mental equipment than her sisters, who were not strong-minded enough to change their ways and so built new nests alongside unoccupied old ones which were in good condition." If a similar individual variation of an action usually instinctive were repeated a number of times the action in the modified form would become a habit. So soon as an animal, in following the promptings of its instincts, becomes able to profit by experience and to adapt the precise form of its activities to altered requirements, we find the beginning of intelligent action. The instinct repeated in the altered form soon becomes mechanically perfect, and ranks as a habit. Between the instincts which were inherited and the habits which are acquired the whole mental activity of which the animal is capable develops.

For the development of intelligence Nature has found room mainly in two ways. In the first place, by slightly relaxing her hold on an instinct she has allowed some freedom of adaptation to circumstances, so far as intelligence was able to profit thereby. Intelligence is mainly acquired in the school of experience. Hence we find that many actions are carried on by instinct to begin with. Thereafter they may be modified to suit circumstances by intelligent adaptation on the lines which experience indicates. Such actions would be in part instinctive and in part intelligent.

A still further relaxation is provided for by the transient character of certain instincts. Many instincts appear to possess their greatest impelling force on the first occasion of their manifestation. Thereafter the experience so gained becomes part of the individual's acquirements, and finds opportunity for its exercise by the disappearance, or at any rate the diminished impulsiveness, of the instinct as such. In this way there may be grafted upon an instinct a habit which outwardly may appear to differ little from the instinctive activity itself, but which has been raised to a higher mental plane. Again instincts

may be "periodic in development and serial in character," hence the experience and intelligence gained by, and the habits formed upon, the earlier manifestations may determine the special direction of the later when they arise.

In the second place, far greater scope for individual adaptation was provided for by the appearance of the period of babyhood in which the young is for a season protected and cared for by the parents. In this way a far greater relaxation of the complexity of instinctive activities has been possible than in species where the needs of life have to be provided for by each individual from the time of birth. The longer the period of babyhood, and the greater the care of the young by the parents, the greater has been the opportunity for the perfection of instinctive activities by imitation, practice, and experience, under circumstances where mistakes were not of serious importance; the greater also the opportunity for the development of intelligence.

When we turn our attention from the animal to man, we find that in the conduct of human life instinct is at a minimum, habit at a maximum. The prolonged period of maternal care has rendered unnecessary the perfection of instinct required for a life self-sustaining from the first. Even those instincts which are most essential to life have lapsed to such an extent that the child is entirely dependent on parental care. Nevertheless the ancestral instincts have not entirely gone. On the contrary the whole range of instinct-feelings found in the animal reappears in human life. But they appear in an altered form as relics of a past. To a large extent they no longer guide man in the perils of life, nor are they trusted to secure him his necessities.

Every instinct, as James says, is an impulse, and we can best understand all the instinct-feelings or impulses of children if we regard them as the representatives of the primitive instincts. The various forms of emotional reaction, the groundless fears of fur, of feathers, of darkness, or the various forms of the play activity can only be explained by referring them to distant heredity. Their present importance, however,

is not to provide relics for the delectation of the antiquarian psychologist. They are necessary stages in the development of intelligence. From them all else ultimately comes.

In former chapters we have already traced how feeling in the form of sense-perception gradually brings the child to a knowledge of the outside world and of his own body; to the formation of ideas; and so to his intellect. On the other hand with the progress of sense-perception the more complex feelings and emotions are excited, recognised, and interpreted by the growing intelligence, judged as desirable or undesirable, and translated into action by the will. Similarly acts which had been reflex or instinctive are learned, understood, chosen deliberately, and, it may be, forged by frequent repetition into habits—habits which may be performed as automatically as instincts yet carry with them the moral value of acts of will.

Summary of the Practical Value of Habit.—1. Habit is a labour-saving device. It saves from a useless waste both of physical and intellectual power.

2. Every stage of our mental life has been built upon a basis of acquired habit (perception, memory, imagination, etc.).

3. In the domain of conduct habit acquires an ethical significance as the acquired result of volitional activity.

The Formation of Habits.—Habit being thus conceived as "the deepest law of our nature" we now turn to the question of how habits can be deliberately formed. The chief rules which can be laid down on the subject are the following: (1) The first requisite is a sufficient motive force at the outset. Professor Bain lays great stress on this rule, inattention to which is a frequent cause of failure. Such a motive may be something extrinsic such as rewards and punishments, love of approval, deference to public opinion. Such motives have their place and value as incentives, but they should be so used as to reinforce and not to overshadow the intrinsic. The great point to be gained is to produce a strong inclination in the child's mind towards the habit aimed at. This is Nature's method of teaching. The strong desire of the young child to touch and handle what-

ever he sees is Nature's method of laying down those habitual associations on which perception depends. Similarly speech is acquired through the propensity to imitate, the pleasure in making sounds, and the desire to communicate with others. All the normal impulses, propensities, interests of children are the indications of some want which is being felt. They imply the presence of power. The aim of education should be to get this power at the back of a desired end, by shewing the child how a legitimate satisfaction of his impulses may be gained. As James [1] expresses it, in a properly rounded development every one of the very numerous instinct-tendencies of the child would start a habit towards certain objects, and inhibit a habit towards certain others.

(2) The second requisite is a long series of repetitions. A stone flies in pieces after many blows from a hammer. Which blow shivered it into fragments? Every blow. Each stroke helped in loosening the particles and defining the natural lines of cleavage. The last stroke only completed what the others began. So in the formation of habits every stroke counts. The work does not have to be begun afresh each morning. Yesterday's strokes are still there to help the process. And behind yesterday's are all the habits already formed, good or bad, to help or to hinder to-day's work.

(3) The third requisite is an uninterrupted continuity of performance. Never allow an exception to occur. This is a rule which is frequently very difficult to carry out, yet any exception undoes a good deal of what has already been gained. One is very apt to err in this respect when a child has been seen to be trying to act up to some rule which has been laid upon him. Some day he fails and one is apt to say to oneself, "Oh! well, poor fellow, he has been doing his best, we won't count this time," forgetting that the omission will count against him all the same. This attitude of mind results chiefly from feeling that the acquisition of a habit is a difficult

[1] W. James, "Principles of Psychology." See chapters on *Instinct* and on *Habit*.

thing, and will go on all the more easily after a rest. The law of habit however is quite to the opposite effect. Any ingrained habit becomes a source of pleasure if continued long enough, more readily of course if the act is in its nature pleasurable. But even actions which are disagreeable at first lose their irksomeness when they become habitual. Hence every exception which occurs when such an act is becoming habitual merely prolongs the feeling of irritation. Children also notice very quickly if an omission on their part is observed and yet passed over without remark, and are very ready to interpret the omission as an indication that the habit in question does not matter very much after all. "Why do you come to table without washing your hands when you know I always send you to do it? asked a mother of her son. "Once you didn't," said the boy.[1]

On some Special Habits.—Habits, like instincts, are passed on from one generation to another, but they are passed by different channels. Instincts are transmitted by heredity. Habits, which may differ almost as little as instincts, in successive generations, are not inherited directly, but passed on by tradition or custom. In order that the child may learn to conform to the best in the customs and traditions of the race, in order that he may as early as possible acquire good habits, it is necessary that he should have a considerable degree of submissiveness. Hence in early life obedience has been generally regarded as the greatest virtue. If it is one of the rights of children "to be well brought up," obedience must become a habit at an early age, in order that the child may profit to the utmost in the wisdom of the race, and with as little conflict as possible between inclination and authority. The child must be taught obedience in order that he may be taught to act in accordance with those rules of conduct which should guide him in after life, in order that, when the time of self-government comes, these may not appear to him strange things to be judged and perhaps opposed. The formation of the habit of obedience need not wait until the child's will has

[1] See Harrison, "A Study of Child Nature."

begun to manifest its activity. The early training of the child in regular habits of feeding and sleeping, the importance of which for the physical well-being of the child has already been mentioned, is itself a training in passive obedience which brings the force of habit to aid in teaching the lesson of voluntary obedience. This is well expressed by Horace Bushnell, who says, "There is what may be fitly called a Christian handling for the infant state that makes a most solid beginning of government. It is the even handling of repose and gentle affection which lays a child down to sleep so firmly that it goes to sleep as in duty bound; which teaches it to feed when food is wanted, not when it can be somehow made uneasy, or the mother is uneasy for it; which refuses to wear out the night in laborious caresses and coaxings, that only reward the cries they endeavour to compose; which places the child so firmly, makes so little of the protests of caprice in it, wears a look so gentle and loving, and goes on with such an evenness of system, that the child feels itself to be, all the while, in another will, and that a good will; consenting thus by habit and quickly to be lapped in authority, just as it consents to breathe in the lap of Nature and her atmospheric laws. And thus it becomes a thoroughly governed creature, under the mere handling of its infantile age."

The same kind of care not only in the careful regulation of the times for feeding and for rest, for bathing and for exercise, but also in the strict attention to cleanliness and neatness in every way will likewise greatly help the child in learning habits of order and punctuality and cleanliness.

Great consistency and uniformity in early training not only aid the formation of such habits as have been mentioned, but increase one's personal influence over the child, teaching him the habit of trust, and making it easier for him to feel that the commands which are laid upon him are in themselves reasonable. The habits of obedience and trust, thus established by the exercise of authority resting on its own right, are now enlisted in the service of the aim of all true discipline, the production of a self-governing being.

Next in order to the natural submissiveness of the child, which enables him to be introduced almost unconsciously into human customs, comes the instinct of imitation whereby he is prompted to play his own part in acquiring the habits of his kind. "Instinct and imitation; there is nothing more perennial in us than these two." The imitativeness of the child is greatly aided by his suggestibility, through which some sense of the relative value of acts may be awakened. Through these the child may learn those complex habits which constitute "good manners," and thereby make an important step in gaining control over involuntary movements and emotions.

In mental training special attention should be paid to the cultivation of the means of acquiring knowledge so that proper habits of thought may be formed. In the training of the special senses much should be made of accuracy of observation, and the child's interests should be widened so that he may find pleasure in pursuing his own investigations into things about him. Accuracy in speech also requires careful training that it may become habitual. "Accustom your children," said Dr Johnson, "constantly to this; if a thing happened at one window, and they, when relating it, say that it happened at another, do not let it pass, but instantly check them; you do not know where deviation from truth may end."[1] Children should also be accustomed to performing whatever they have to do promptly and expeditiously. When the time for lessons comes, speed in learning should be encouraged as well as accuracy, in order that the habit of attention may be formed. This will be rendered much more difficult if such bad habits have been permitted to develop as dilatoriness in dressing, or getting ready to go out, or dawdling over meals. Similarly the child's early training in order and neatness will aid the development of orderliness of mind, assist him in forming the habit of comparing new knowledge with old, and of discovering the connection between the objects of knowledge.

"The peculiarity of the moral habits," says Professor

[1] Boswell's "Life of Johnson."

Bain, "distinguishing them from the intellectual acquisitions, is the presence of two hostile powers, one to be gradually raised into the ascendant above the other. It is necessary, above all things, in such a situation never to lose a battle. Every gain on the wrong side undoes the effect of many conquests on the right." Hence the importance of arranging the force of habit on the right side in advance. A moral habit is not thoroughly established until the sense of conflict is lost. A child is not really truthful until it has become his second nature to tell the truth, even when doing so conflicts with a momentary inclination to seek a short way out of a difficulty. When a difficulty of this kind does arise, and the child is tempted to tell a self-interested lie, nothing can help him more than a carefully acquired habit of truthfulness and accuracy, which will often cause him to answer truthfully almost before he feels the temptation to do otherwise. Yet in this, as in all habits which can be called moral, the child must win his own battles. The function of education is to guide the intellect into a knowledge of right and wrong, to supply motives for right conduct, and to furnish occasions for the exercise by which alone moral habits can be cultivated. Duties should come to the child as a privilege and a trust. "A sense of duty done calls forth a feeling of independence." The child should be trained in the habit of kindness and thoughtfulness for others, and especially should advantage be taken of times when he is in the mood to display a disposition to increased confidence or affection to find or suggest occasions for service, that his emotions may not by habit become a mere sentimentalism. In training in moral courage, likewise, exercise is of the greatest importance, and especially the development of habits of self-reliance. Here lies the danger of too frequent appeal to the lower motives of conduct, and especially of encouraging too great deference to public opinion, by constantly asking about trifles, What will people think? or What will people say?

CHAPTER XII

Froebel and the Kindergarten

A Mode of Nurture

The chief aim of education in the past has been the imparting of knowledge. The object of the teacher has been to induce his scholars to learn, and by the drill of frequent repetition to cause them to remember. The material of instruction was confined to such subjects as could be studied in books. The most successful teacher was he whose scholars knew most, as tested by examinations.

For many years there has been growing up in our midst a new conception of education, which looks primarily not to the knowledge to be taught, but to the individual to be educated. To Pestalozzi especially we owe the conception of education as the development of all the powers of each individual, beginning with the senses and proceeding through them to the mind. This idea was worked out much more fully and systematically by Froebel, who not only greatly extended the educational theories of his predecessors, but worked out their practical application. By crystallising his ideas in the kindergarten Froebel rendered one of his greatest services to education, for he has thereby provided an object lesson which appeals to the practical mind of thousands of teachers who otherwise would have regarded his principles as abstract theories and nothing more. The kindergarten is not simply a method for teaching young children. It is the application to their education of those laws which, as Froebel held, should govern the whole education of man.

In designing the kindergarten, Froebel had constantly in view not only the children but the women who should be their teachers, and he desired intensely that his principles should be recognised not only in the school but in the home. Nine women out of ten spend the best years of their lives

in the education of young children. For such a task woman is specially fitted by her natural love for children, her patience, her tact, her fertility of resource, her power of intuition. But in training young children mind is needed as well as heart, and Froebel desired that all women, whether likely to be teachers or not, should find in the kindergarten a means of exercising and developing their natural gifts, of gaining practical experience in the care of children, and of receiving such a culture of heart and mind as should convert instinct into insight. "My whole strength," he says, "is exerted to the work of getting the natural instinct and its tendencies more rightly understood and more acknowledged; so that women may follow its leadings as truly as possible aided by the higher light of intelligent comprehension." What the kindergarten is capable of effecting in this way is abundantly witnessed by the enthusiasm and earnestness of Froebel's followers. As Mrs Wiggin writes, "many a girl has said when the purpose of the kindergarten began to dawn upon her, that she then first understood the meaning of existence, and we doubt whether a more eloquent commentary on the value of the study could be made than such an exclamation from a young girl just entering life, with all its hopes and enchantments shining before her eyes."

Froebel's Educational Ideas.—Socrates said he could learn nothing from trees. Froebel, who loved Nature as the symbol of the invisible, always declared that a tree had been his teacher. The tree was to him the type of the unity of Nature, a conception which dominated all his teaching. The gradual growth in his mind of the means whereby his ideas might take visible shape he speaks of as the growth "of a beautiful tree of life within me," and when the name "kindergarten" occurred to him it seemed an inspiration. "Eureka, I have found it!" he exclaimed.

The idea which is now generally spoken of as the uniformity of Nature, the idea of unity, the idea that there is nothing isolated in the universe, but that all things continually work together, inspired Froebel to study the laws of Nature,

and to try to find therein the methods of that work into which he threw all the great energies of his mind and heart. The tree was the symbol of unity. The growth of the tree symbolised to him the growth of the child. He saw that if the tree is to grow strong and graceful after its kind, the conditions must be favourable ; that soil, and air, and sunshine, and all healthy and stimulating influences must be combined with care and shelter from frost and cold, and too keen competition in the race for life, if beautiful and harmonious growth is to be attained. But given all these, the growth of the tree is but an unfolding of its own inner nature. So, as he taught, must be the growth of the child. If the child is to develop towards an ideal manhood, he, also, from his youngest days must be encouraged to put forth his strength in right and useful ways. The unity in the life of every man means that every stage of development must be lived perfectly if the next is not to suffer. A perfect manhood can only grow out of a perfect childhood, and consequently to attempt to force on children ways which are not their ways, ideals which cannot be their ideals, forms of words which cannot have meaning for them, can only result in dwarfing their minds and preventing their ever attaining such stature as they should. Utterly rejecting the doctrine of the total depravity of human nature, he had faith to believe that the child might be trusted, with liberty and opportunity, to be the active agent in his own education. But by liberty he did not mean license.

Again Froebel saw clearly how closely in every stage of development all the bodily and mental powers are intertwined, so that it is impossible to neglect any one without impairing all. In mental training he laid stress on the connection between feeling, knowing, and doing, and taught that side by side with the acquisition of knowledge must go the practical application of the knowledge acquired, and training in its application to good ends.

An ardent student of science, Froebel saw the unity between the individual and the race, and in the study of the

history of the race he sought for guidance in the means of individual culture, as indeed had to some extent been done by others before him. A believer in development or evolution before the doctrine of the evolution of species was known, he recognised that in every child the history of the race is summarised. Hence he concluded that knowledge of the stages of development through which the race had passed would indicate the stages, and hence the necessary material of instruction for every stage, of child life.

But the study of the race meant something more than this. Froebel's idea of unity meant to him that in all Nature and in all the history of man there was to be seen the unfolding of an eternal divine plan. Hence the education of an individual child along the lines of race progress meant to that extent a furtherance of this plan, and in the possibility of raising the child into consciousness of his unity with others and with the race, and to a knowledge of the universal interdependence, he found the highest incentive to individual effort. For in no other work, he thought, does man become so truly a fellow-labourer with God.

Self-Activity.—If the end of education be to train man's powers in harmonious development, how can this be done? To Froebel there seemed to be only one answer possible—by exercise. This answer is one which meets us everywhere in Nature, for it is universally true that every organ is maintained in efficiency and power by exercise, and that every organ that is not exercised tends to degenerate and disappear. The blind fish of the mammoth caves, the sightless crustacea of the great depths, the flightless birds of Australasia, the wingless insects of many oceanic islands all teach us a lesson which is too frequently ignored. Many teachers have endeavoured to educate the child by training some of his powers only, while others were neglected. Children have been made to learn words, rules, formulæ which they could not understand on the plea that the exercise would at least strengthen their memories, and when at last they have been thoroughly drilled into work of this kind they have been

blamed for "learning like parrots," though they "could none other." They have been made to sit still, to suppress their energies, to control at least the activity of their bodies, and when at last they have learned the lesson of listlessly allowing their minds to wander, have been scolded and punished for laziness and inattention. To get over these and other defects in educational methods Froebel thought out the process of self-activity, and the symbol of self-activity he found in the child's play. Although Froebel was the first to make a systematic use of play for the education of children, he was not the first to see the falsity of the popular view that children's play is merely a means of passing the time. Here, for example, are two well-known quotations from Plato, which are often cited in this connection, and whose spirit is in close accord with Froebel's teaching:—"Play has the mightiest influence on the maintenance and the non-maintenance of laws; and if children's plays are conducted according to laws and rules, and they always pursue their amusements in conformity with order, while finding pleasure therein, it need not be feared that when they are grown up they will break laws whose objects are more serious." And again:—"From their earliest years, the plays of children ought to be subject to strict laws. For if their plays, and those who mingle with them, are arbitrary and lawless, how can they become virtuous men, law-abiding and obedient? On the contrary, when children are early trained to submit to laws in their plays, love for these laws enters into their souls with the music accompanying them, and helps their development."

By the study of children's play we learn how the harmonious development of the child takes place before he comes to school. When a child is at play he is not merely receiving impressions but he is also forming ideas,—all his actions are expressive of these ideas. The child not only "learns to do by doing," but he "grows by doing." So when he goes to school his receptive powers should be developed not by the teaching of words only, but by shewing him things, and allowing him to handle them, and find out

as much as possible about them for himself; his reflective powers should be guided to connect this knowledge with what he already knew so as to enlarge his ideas; and his executive powers should be trained in giving expression to these ideas.

Froebel believed that play was the most serious occupation of young children. In play, he says, "we see the whole future life of man epitomised, the secret recesses of dawning mind are therein revealed to us as in a mirror. Healthy unforced play results in an intensified pleasure in existence for the child; he is then at peace with himself and all the world. In it lies the germ of all human goodness; it is the growing point out of which all true service in after life springs." "Whether the future life shall be pure or sullied, peaceful or rent with passion, industrious or indolent; whether it shall be a kind of dull vegetative existence, or a life full of high conscious purpose; a life at peace or at war with society; all these questions are raised and in fact determined by the nature and the conditions under which a child plays." Froebel therefore set himself to study the playing child that he might discover the meaning and the value of the different forms of the play activity. He collected the traditional baby-plays and songs which he found in use among the German peasant mothers. These games and songs he adapted for use in the kindergarten and supplemented by others which he invented to serve special ends. A collection of such games and songs he afterwards published in "The Mother Play" (Die Mutter und Kose-Lieder), and on them are founded all the games played in the kindergarten to-day. Froebel regarded this as the most important part of his educational work. "He who understands what I mean by these songs knows my inmost secret." While these games are intended to exercise the senses and train the muscles in harmonious movement, they are more particularly directed towards the child's future development. They feed his imagination and cultivate his feeling, and especially awaken the social instinct, and help him to some dim sense

of moral relations. The games are interspersed with little songs which help to shew the child the meaning of the game, and accompanied by simple melody which develops the child's natural love for music upon the educational value of which the kindergarten lays great stress. An essential feature of Froebel's system is that the kindergartner, in carrying on her work, must have such a perfect comprehension of the ends to be served, and such a perfect command of the child-mind through his natural imitativeness and suggestibility, that the games, although taught by her, must yet be chosen and played with perfect spontaneity by the children. They must be the free expression of their self-activity.

The games and songs, the various kindergarten occupations, the naming of objects used and the conversations about them, all lead on naturally to other means of expression, and drawing, writing, and reading are reached through the active instinct of the child and his growing imagination constantly prompting him to seek fuller and more adequate means of representing his ideas. In using drawing as a means of expression Froebel was following a natural instinct of the child who always tends to use drawing in this way, just as primitive man made scratchings and drawings on pieces of bone or tusk, not for the sake of artistic effect, but to tell a story. Drawing as a means of expression is a great stimulus to the child's powers of observation. In the first attempts at representation the child tends to draw not what he sees or might see, but what he knows to be there, thus illustrating the fact that perception is really an act of judgment. For example, in drawing a table he will represent all four legs, not recognising that only two or three should be visible; or in representing a face in profile he will draw the eye as seen from the front or may even insert both eyes. As he learns to notice the incongruity between his drawings and the real things he is led to observe objects more carefully in different positions, and even, in time, to gain some practical knowledge of perspective, though this is to be regarded as a secondary result. Young children as a rule take great pleasure in drawing in this way, illustrating

scenes and actions that have interested them, or pictorially telling stories which have been narrated to them. Drawing is now being recognised as a very valuable educational method long after the ordinary kindergarten age, but when the age of nine or ten is reached there is often a marked falling off of interest or even a dislike of this means of expression. This may be associated with a growing sense of the artistic value of drawing, or may be connected with the development of the critical mood, which often at this age causes a diminution in the relish for fairy tales.

The child being introduced by means of the games and occupations to some understanding of order, measure, form, size, relationship, number, the way is paved by the concrete knowledge thus obtained for the further study of arithmetic and mathematics, in which the children should continue to find problems for themselves as well as to solve them.

By self-activity, therefore, Froebel meant much more than the exercise of the child's activity in various forms of co-ordinate movement. It is a well recognised fact that in matters of technical skill merely theoretical instruction is comparatively valueless. All occupations which require the skilful use of the limbs such as drawing, or wood-carving, or modelling, can be learnt only by practice. It has also been recognised to some extent that such acquirements have a higher educational value on account of the patience and perseverance which their perfect execution involves. But the process of self-activity involves more even than this. It requires that the child's activity should be so used as to afford exercise for his originative powers, so that the whole of the self may be active. It is not enough that the child be receptive of ideas. It is not enough that he should be able to express the ideas of others. He must learn to form ideas of his own and to express them in his own way, for only thus can he be trained to a rounded harmonious use of his powers. How the child may be rightly guided in his years of weakness without doing violence to his spontaneity is what the kindergarten claims

to teach. It may seem to some that Froebel took too hopeful a view of child-nature. It may seem that in laying so much stress on the development by exercise of the native instincts and tendencies of the child, and thus training him by making "the inner become the outer," he did not realise sufficiently the existence of evil tendencies as well as good. But indeed Froebel did not fail to realise the necessity for control, only he believed that to rule a child's will by coercion or by fear was to attempt to obtain the fruit of obedience without planting the seed. So before the child is old enough to reason he would awaken the spirit of obedience through his natural trust and love. He would have all commands recognised as the expression of law by eliminating all caprice. Yet he would lead the child into obedience not to the felt pressure of law, but in the spirit of joy in voluntary service. He would try to starve tendencies to evil by denying opportunity for their exercise. But still more would he strive to discover and train the opposite good side of character, that evil might be overcome with good.

Nature Study.—Froebel was an enthusiastic lover of Nature, and he would have every child learn to love her too. This deep love we find constantly expressed in his writings, and everywhere we notice two features of his teaching—his tenderness, and his love for symbolism. He had drunk deeply of the spirit of St Francis of Assisi, who "in his Catholic wholeness called the very flowers" his sisters. Like St Thomas à Kempis he believed that "if indeed thy heart were right, then would every creature be to thee a mirror of truth and a book of holy doctrine." Nature was to him the garment of the invisible God, and he believed that if a child could be led to touch that garment hem virtue would come out of it, in the form of a moral and spiritual quickening of the child's life. His thought was that the child should be led to love all living things as play-fellows, to delight in their beauty, and to find in them ideas and symbols of truths. "From objects to pictures, from

pictures to symbols, from symbols to thoughts," says Froebel, "leads the ladder of knowledge." The object of Nature study is to interest the child in the things about him and to develop his faculties. Froebel had no idea of teaching "science" to young children. The time for that is not yet, and the childish propensity to pull things to pieces in carelessness or idle curiosity is rather to be checked than encouraged. So by teaching the child how to treat the kitten, how to look after his pet animals, and especially by letting him have a little garden in which he might cultivate his own plants, he would develop in him a love for living things, and lead him to a new knowledge of his own powers, in learning how he could help these playfellows to a higher and more beautiful life. Thus little by little the child would grow into an appreciation of the spirit of Emerson's words, "Hast thou loved the wood-rose and left it on its stalk?"

Such teaching enriches the child's thoughts and keeps alive his wonder power, it stimulates his imagination, it widens his interests, it exercises his observing powers, and creates in him a thirst for knowledge. In this, as in all his teaching, Froebel thought much of the development of the child's powers; little of the mere imparting of knowledge.

The Kindergarten.—In the practical carrying out of his educational ideas Froebel claimed that the child belonged both to the family and to the state. Hence one great aim of the kindergarten is to prepare the child for social life by letting him spend some hours of the day in a common fellowship. The means which Froebel provided for training the children are found in his "Gifts," his "Occupations," and his "Mutter und Kose-Lieder," that collection of children's games and songs which has been called the Kindergarten Bible. All these are definitely educational in purpose. They are not simply toys or games with which the children may be kept busy or amused, but are designed with special reference to the needs of the child to serve as means of exercising and developing all his powers. It would

be out of place to attempt to describe any of these individually, for Froebel's educational ideas as applied in the kindergarten can only be grasped by studying the various materials in their proper order of succession, in their connection with one another, and in their application to the developing faculties of the child. The "Gifts" are especially intended to be used in such a way as to attract his attention and stimulate his curiosity, to train his powers of observation, and so to develop his intellectual faculties. The "Occupations" are designed to train the active application of the intellectual faculties to practical uses. The games are of some value as physical education, but, used in conjunction with songs and stories, are specially designed to assist the child's ethical development by training him to sympathy and kindness, and to a sense of social relationships through play with other children of his own age. "Take the simplest circle game; it illustrates the whole duty of a good citizen in a republic. Anybody can spoil it, yet nobody can play it alone; anybody can hinder its success, yet no one can get credit for making it succeed."

As to religious culture, the spirit of the kindergarten, so far as it is true to the spirit of Froebel's teaching, fosters the development of the religious mood, and helps to prepare the soil in which alone true religion can grow. Religion and morality are never separate in Froebel's teaching. Religion, in his belief, must be the foundation of all true education, but "religion is not an emotion or a dogma but a service." Hence he objected to any formal teaching of either religion or morality to young children, whose spiritual nature can only be injured by indoctrination in maxims and creeds in advance of the understanding and experience which alone can give them life. In place of trying to impress the forms of religion on the minds of the children, he sought to awaken the spirit of love and wonder and reverence in their hearts. Far from believing that there can be no real religious teaching which is not doctrinal, he strove to frame in his system, by symbol and parable, a presentation of religion from which the child

may gather such suggestions and ideas as he is ready to receive.

The ethical and religious end is fundamental in Froebel's system, and the kindergarten is as a body without a soul in the absence of clear insight into his design that the children, while believing that they are only hearing a story, or playing a game, or making some article of beauty or of use, are yet, all unconsciously to themselves, being trained to conform all their feelings, desires, and impulses to real goodness, and are being "led by a way that they know not" into some sense of allegiance to duty and to God.

The Practical Results of the Kindergarten.—The kindergarten is specially intended to utilise the two or three years of childhood which precede the time of entrance to the primary school, and of its real educational value for children between three or four and six years of age there can be no reasonable doubt. Most of the criticisms to which the kindergarten may be allowed to be open depend upon the fact that for its right employment the system makes very special demands upon the teacher. Froebel's ideas, as Mr Quick remarks, are not so easily got hold of as his "gifts," and if the teacher is not possessed by nature, education, and special training of the necessary qualifications, the kindergarten may easily become mechanical and formal, impose upon the child's individuality instead of developing it, and lose to a large extent its power for good. But this is no real objection to Froebel's system, for nothing can make the education of young children in any real sense of the term anything but difficult, and if the kindergarten has emphasised the absolute necessity of culture and training for all teachers of young children, and the impossibility of a single teacher taking sole charge of sixty or seventy children just coming out of babyhood without injuring them, let it be counted to it for a merit.

As to the actual achievements of the kindergarten it must be remembered that the main object of the system is not to instruct, but to develop the child's powers, and so to prepare him for the period of school life. Nevertheless, in striving

to promote the harmonious expansion of the child's whole nature, the kindergarten may claim to produce very tangible results without appearing to aim directly at them. Amongst these results we may especially mention the following :—

1. The child's senses are cultivated, and through them his mind is awakened.

2. In playing with the gifts the child gains considerable knowledge of arithmetic—counting, addition, subtraction, multiplication, etc.

3. In an experimental way he gains a practical knowledge of form, size, and proportion. He knows something of horizontal, vertical, sloping, straight, and curved lines ; of triangles, squares, and oblongs ; of spheres, cylinders, cubes, prisms, and this knowledge prepares the way for an intelligent comprehension of geometry.

4. The occupations not only allow the child to acquire individual experience by producing and reproducing something of his own, but they lay a foundation for the manual training which is coming to be recognised as an essential part of any intelligent system of education.

5. By means of conversation, stories, and singing, the child's vocabulary is greatly increased, his pronunciation is improved, and he is taught to express his own thoughts freely and correctly.

6. Drawing is encouraged as a means of expression, and the training of the eye and hand so obtained greatly simplifies the acquisition of reading and writing.

7. The child's whole environment and training in the kindergarten foster the development of his sense of beauty.

8. The co-operative work of the kindergarten, the games, and the rational method of discipline, shew the child the nature of his acts in relation to others, and promote his moral and social training.

Such are some of the more obvious results which can be claimed by a good kindergarten, and if children could come to school with such a grounding it is evident that the work there would be greatly facilitated, especially if the teacher

appreciated the value of Froebel's ideas, and had heart enough and head enough not only to instruct but to train.

In conclusion, one other aspect of kindergarten work must be referred to, namely, the place of the kindergarten as a philanthropic agency. Remembering what has been said in previous chapters as to the influence of nurture in drawing out the possibilities latent in the child's nature, we may regard the kindergarten as an artificial environment specially designed to furnish the child with liberty and opportunity for the exercise by means of which alone his faculties can develop. Whatever the kindergarten is capable of doing for the child who comes from a refined home where all other influences co-operate in furnishing opportunity for healthy bodily and mental exercise, it is obvious that it is most needed for those whose opportunities are least, and whose early education is left to ignorance and chance. Considering the vacuity of mind and the lack of interest with which such children often enter upon school work, it is somewhat surprising that a system which, in good hands, is capable of so much as the kindergarten should have come to be regarded in this country as little more than a luxury for the rich. Few things shew more plainly than this how completely we are still dominated by the old conception of education as a process of pouring knowledge into the mind.

In many countries there are free kindergartens, especially in America where many towns of moderate size have more of them than the whole of England, and where their educational value has come to be so fully recognised that their final adoption into the public school system is regarded by many as only a matter of time. The free kindergartens were started in the first instance for the sake of the children of the streets, that the years of their life before the public school is open to them might not be utterly wasted or worse than wasted, and year by year it appears that the value of their work as a social mission is being increasingly recognised in many ways. They serve, for example, as schools for training teachers and others in kindergarten work. To many a girl leaving school or college

life they afford a needed outlet for the sympathy and energy which can only find expression in consecration to some human interest. They serve as object-lessons in education to parents, to teachers, and to school boards, and this is an important aspect of their work, for the full value of Froebel's ideas will only be understood when they are carried forward into the education of the older pupils. For the children themselves they mean a step towards that at present far-off educational ideal, equality of opportunity for every child; they mean, if it be for only a few hours a day, an environment into which enters the beauty of form, of colour, of music, of story, and the personal influence of love, and patience, and justice, and truth; they mean, if only for a few hours a day, an atmosphere of joyousness, of interest, of that productive self-activity, whose influence on future development is greatest in the early years of life.

Does there seem to be some exaggeration in claiming a real educational value for such an influence brought to bear day by day on children so young? It will not seem so, I think, to any who knows how true is Froebel's teaching that every stage of human development is conditioned by what went before, or who understands how the child's whole future life may be influenced by the outlets which his various instinctive impulses find as they arise. Does it seem a vain dream that the kindergarten may have a mission among the degraded classes of our large towns, where it so often seems

> "As if some lesser god had made the world
> But had not force to shape it as he would?"

Is it not here especially that we need Froebel's teaching that the best in life cannot be given but must be won, and that it never can be won if the early years of life are starved? Even in the lowest strata of society the child, however handicapped by heredity, is yet human not only in shape but in promise; human, also, in that educability which shews itself in adaptation to whatever environment may press upon him. It does require faith, no doubt, to see that every child inherits

something more than "the emptiness of ages"; to see, with Froebel, that there is a divine idea for every child which education must find and develop. But to see this is to hope.

Michael Angelo, it is said, one day saw a great block of stone in a quarry. "Send that to me," said he, "I see an angel in it."

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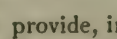

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